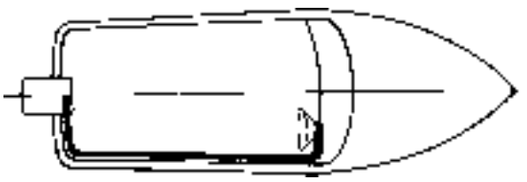
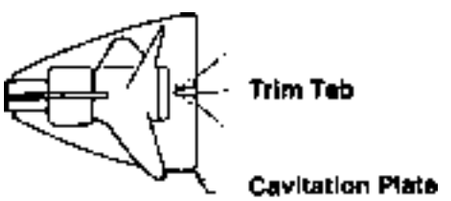
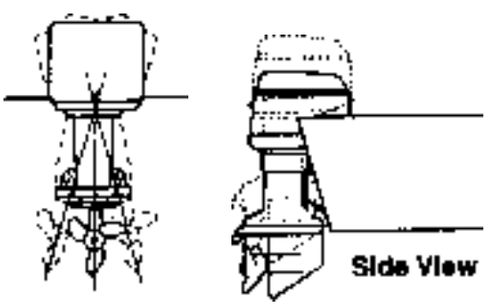


Plan the most direct cable route. Keep the number of bends to a minimum and do not bend the cable less than the minium specified bend radius. The trim settings of outboards and sterndrives can markedly affect steering loads and boat maneuverability. The motor trim tab should be set in accordance with the motor manufacturer's recommendations. The boat should also be tested for ease of steering through the full range of motor trim angles since varying trim angles can change steering loads on any given system.

The mounting position of the outboard also affects the steering and boat handling characteristics. Mounting specifications established by the boat builder and engine manufacturer should be adhered to strictly.

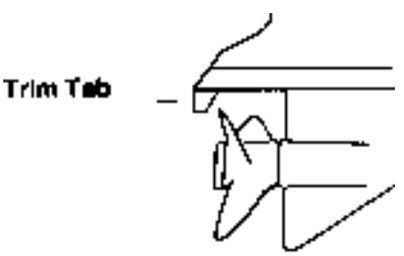


Bottom View



Back View

Side View



Side View

The proper steering system is a critical factor in achieving good boat handling performance and safe operation. The combination of engine horsepower, propeller torque, hull design and boat speed exerts varying loads on steering systems. Because the resulting steering forces vary considerably from boat to boat and motor to motor, extreme care must be taken to ensure the steering system you select matches the application.

The following guidelines have been developed to assist you in making a steering system selection, and in particular alert you to potential problem areas.

- •Steering forces increase considerably when the speed and horsepower of the boat increases. High performance boats often leave and re-enter the water momentarily, creating High shock loads on the steering system. In addition, certain hull designs may have a tendency to lose stability at high speeds, a condition commonly called "chine walk."
- •The speed at which instability begins to occur varies significantly among different type boats. A Morse twin cable or hydraulic steering system is generally recommended for boats moving at higher speeds.
- •Corrosion of steering cables can lead to stiff operation and complete seizure. The steering cable should be regularly inspected for cracks or cuts. If found, the cable should be replaced. If there are no signs of cracking, the cable output end and the engine tilt tube should be cleaned thoroughly, coated with a quality marine lubricant, then properly reassembled and maintained according to the engine manufacturer's specifications. Corrosive buildup can be minimized through this simple routine maintenance. Whenever possible, the boat builder and dealer should select Morse cables which all have Stainless Steel output ends to reduce corrosion, especially on boats used in salt water. Even then, if a boat is not going to be used for extended periods of time, it is recommended to completely remove the cable output end from the thru tube and properly prepare for storage.
- •The routing of steering cables is also an important consideration. Multiple bends in the cable and small bend radii will contribute to cable backlash and steering inefficiency. Cables should be routed with as few bends as possible and with the optimum radii achievable.
- •Excessive cable length results in excess bend radius, contributing to excess backlash and cable inefficiency. If an installation requires a 16 ft. cable, a 16 ft. cable should be used. Do not add unnecessary length.
- •Larger boats with displacement hulls and inboard rudders can create steering loads that exceed the capacity of the mechanical steering systems commonly used on runabouts. Hydraulic steering systems are better suited to function under high steering loads.
- •Although Morse Controls designs and manufactures steering systems to meet existing industry standards, the boat builder and dealer are ultimately responsible for determining the particular steering system best suited for the intended application. For further technical assistance in specifying steering systems contact Morse Controls.

MORSE CONTROLS

A Complete Replacement Rotary Steering System for almost the price of a cable.

Easily replaces Morse, Teleflex and Uflex Systems.

Perfect for the Do-It-Yourselfer!

A complete quality steering system in one single box
- **Drive Assembly**
- **Bezel**
- **Cable**

C-290 Packaged Rotary Steering System
Complete Quality Steering System in a Box

Complete steering systems include helm, cable, and 90 degree bezel. Available in 1 foot increments from 6-20 feet. Wheel not included.

- Bolt-in replacement for Morse and other steering systems with no new holes to drill.
- Quality cable with stainless output ends.
- Quick and easy to install.
- Choice of cable entry positions.
- High durability with heavy duty casing, machined drive gear and one-piece steel pinion shaft.

Applications:
- Generally the Command 290 can be used on boats up to 35 feet in length.
- 300 lb. maximum working load at the tiller end.
- Some high performance boat engine combinations develop steering instability at high speed. Instability becomes more prevelant in boats faster than 50 MPH. A twin cable system, MPS - Morse Power Steering or a Hynautic hydraulic steering system is recommended for these type boats.
- Hynautic hydraulic steering is recommended for boats not equipped with power steering, that have a working load of 300 lbs. or more at the tiller end.
- Maximum steering wheel diameter is 16"
- The Command 290 should not be used on boats equipped with engines that exceed the maximum rating of the boat.

Warning
Although Morse Controls designs and manufactures steering systems that meet or exceed all existing industry standards, it hsould be noted that some high performance accessories such as motor jack plates and high performance propellers can generate steering loads far in excess of 300 lbs. at the tiller end. It is mandatory that boats equipped with high performance equipment or accessories be water tested to insure that steering loads are within safe operating limits. For more information, refer to the instruction sheet or contact Morse Controls.

System in a Box
Stocked in 1 foot increments from 6 to 20 feet.
Stock #
MOR309273 ..... Command 290 Rotary Steering Package

A complete quality steering system in one single box
- **Drive Assembly**
- **Bezel**
- **Cable**

A Complete Rack and Pinion Steering System for almost the price of a cable.

Perfect for the Do-It-Yourselfer!

C-200 Packaged Rack and Pinion Steering System
Complete Quality Steering System in a Box

Complete steering systems include helm, cable, and 90 degree bezel. Available in 1 foot increments from 8-20 feet. Wheel not included.

- Bolt-in replacement for Morse and other steering systems with no new holes to drill.
- Quality cable with stainless output ends.
- Quick and easy to install.

Applications:
- Generally the Command 200 can be used on boats up to 35 feet in length.
- 700 lb. maximum working load at the tiller end.
- Some high performance boat engine combinations develop steering instability at high speed. Instability becomes more prevelant in boats faster than 50 MPH. A twin cable system, MPS - Morse Power Steering or a Hynautic hydraulic steering system is recommended for these type boats.
- Hynautic hydraulic steering is recommended for boats not equipped with power steering, that have a working load of 300 lbs. or more at the tiller end.
- Maximum steering wheel diameter is 16"
- The Command 290 should not be used on boats equipped with engines that exceed the maximum rating of the boat.

Warning
Although Morse Controls designs and manufactures steering systems that meet or exceed all existing industry standards, it hsould be noted that some high performance accessories such as motor jack plates and high performance propellers can generate steering loads far in excess of 300 lbs. at the tiller end. It is mandatory that boats equipped with high performance equipment or accessories be water tested to insure that steering loads are within safe operating limits. For more information, refer to the instruction sheet or contact Morse Controls.

System in a Box
Stocked in 1 foot increments from 8 to 20 feet.
Stock #
MOR309816 ..... Command 200 Rack and Pinion Steering Package

Command 200 Rack and Pinion Steering System

•Sports car responsiveness on your boat.
•Easy to install.
•Single or twin engine.
•Compact size.

Stock #	Description
MOR300252	Single Helm
MOR300853	Twin Helm
MOR300470	20° Black Bezel
MOR300519	90° Black Bezel
MOR308562	20° Electrified Bezel
MOR308560	90° Electrified Bezel

Use of the electrified bezel with Command 200 requires replacement of Command 200 helm with Command 200 modified helm.

MOR308906	Command 200 modified single helm
MOR308907	Command 200 modified twin helm.

Accessories

MOR300255	Rudder Position Indicator

Brake knobs for helm assemblies shipped with bezel kits.

Command 200 System

Command 200 Twin System

90° 20° Bezel

Rudder Position Indicator

Command 200 Cable

Stock #	Description
MOR300620	5 feet Rack and SST cable

Command 290 Rotary Steering Systems

The command 290 Rotary steering system has a combination of features not available on other rotary systems. Its quality and rugged design make the Command 290 top of the line original equipment and the ideal replacement for most other rotary systems.

Stock #	Description
MOR304857	Helm w/Brake
MOR305015	Twin Helm w/Brake
MOR308559	90° Bezel - Black
MOR308561	20° Bezel - Black
MOR300959	TRC™ Cable Adapter
MOR301098	Replacement Takeup Tube

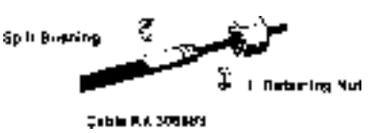
90° 20° Bezel

MOR309305

MOR300959

TRC™/290 Steering Cable

Stock #	Description
MOR304415	5 feet to 50 feet Cable with removable nut only.



Complete System Replacement

If a Big-T® or Safe-T® helm needs to be replaced, the Morse Command 290 helm fits existing mounting cutouts for Safe-T® and easily substitutes for Big-T®

MORSE CONTROLS

Replacement Steering Cables for Teleflex® Inc. (U.S.A.) -Rotary

TRC Cable 304415_____ft.

Replaces	original part no.
Teleflex® Big-T®, Safe-T®	SC-72
Teleflex®Big-T®, Safe-T®	SSC-72
Teleflex® Big-T®, Safe-T®	SC-106
Morse Command 250	300962
Morse TRC/OEM	304411
Morse TRC/290	304415

Command 200
Rack and Pinion Tilt Steering System

•The precision performance of rack and pinion steering with the convenience of a tilt wheel.
•Mounting cutouts are exactly the same as the standard Command 290, making tilt steering easy to retrofit.

Order:
1 Helm, (single or twin, 90° mount or 20° mount), 1 or 2 Steering Cables, 1 Connection Kit if required.

90° Mount on Angled Dash

20° Mount on Vertical Dash

System Component Part Numbers

Stock #	Description
MOR308900	Command 200 Tilt 20° mount, single
MOR308901	Command 200 Tilt 20° mount, twin
MOR308902	Command 200 Tilt 90° mount, single
MOR308903	Command 200 Tilt 90° mount, twin
MOR300620	Command 200 replacement cable

Accessories

MOR308896	Command 200 Tilt Helm single, replace ment hardware bag.
MOR308897	Command 200 Tilt Helm twin, replace ment hardware bag.
MOR307577	20° Black Boot
MOR307578	90° Black Boot

Command 290
Rotary Tilt Steering System

•Five tilt positions within a 40° range.
•Constant velocity universal joint design with rigid polymer Celcon® bearings creates smooth sports car type steering at all angles.
•Protective UV stable bezel helps guard system components against incidental water.
•Bolt in replacement for Command 290 makes retrofit easy.
•Drop-in replacement for Teleflex Safe-T and functional replacement for Teleflex Big-T.

Order:
1 Helm, (single or twin, 90° mount or 20° mount), 1 or 2 Steering Cables, 1 Connection Kit if required.

System Component Part Numbers

Stock #	Description
MOR307560	Command 290 Tilt 20° mount, single
MOR307570	Command 290 Tilt 20° mount, twin
MOR307580	Command 290 Tilt 90° mount, single
MOR307585	Command 290 Tilt 90° mount, twin
MOR304415	TRC steering cable

Accessories

MOR300959	Cable Adapter (adapts Morse Command 290 Tilt to a Teleflex SSC-72 Steering Cable.)
MOR301098	Replacement Cable Takeup Tube
MOR307555	Replacement Command 290 Tilt 20° single/twin hardware bag.
MOR307554	Replacement Command 290 Tilt 90° single/twin hardware bag.
MOR307577	20° Black Boot
MOR307578	90° Black Boot

Command 2 Rotary Steering Systems

Stock #	Description
MOR300376	Standard Helm
MOR300836	Twin Helm
MOR300470	20° Black Bezel
MOR300519	90° Black Bezel
MOR300602	10° Black Bezel
MOR300255	Rudder Position Indicator
MOR67834	Drive ONLY (2 req. for twin system)

Brake knobs for helm assemblies shipped with bezel kits.

Standard Helm

Rudder Position Indicator

Command 2 Cable only

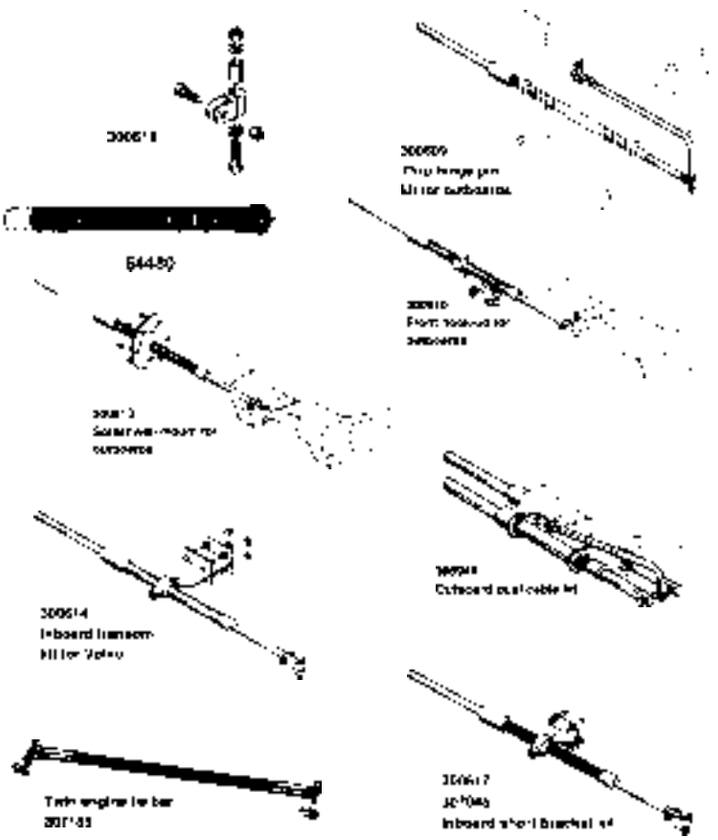
Stock #	Description
MOR300622	Cable - SST 5 feet to 50 feet

Black Bezels

Steering Connection Kits

Most boats and engines are supplied complete with steering cable connection kits. Listed below are specialty kits which are now available for Morse Controls.

Stock #	Description
MOR64480	Support Tube, Aluminum
MOR300609	Thru hinge pin kit for 1973 and later Johnson/Evinrude 50 h.p. and up. All Mercury 40 h.p. and up except v-6's
MOR300610	Front Hookup, Transom Mount (Galvanized)
MOR300611	Front Hookup, Transom Mount (SST)
MOR300612	Adapter bracket for Johnson/Evinrude 40 h.p. and under
MOR300613	Splashwell Mount
MOR300614	Volvo, 1977 and earlier
MOR300617	Inboard, short bracket, 2"
MOR307046	Inboard, short bracket (SST)
MOR300618	Swivel Assembly Only
MOR305296-001 .	Twin Engine Tie-Bar Assy.-32" centers
MOR305296-002 .	Twin Engine Tie-Bar Assy.-34" centers
MOR307185	Twin Engine Tie-Bar Assy.-36" centers Dual Cable Steering Kit, Suzuki V-6 Outboard
MOR308949-001 .	Mercury Outboard Dual Cable Steering Kit
MOR308949-002 .	Johnson/Evinrude Outboard Dual Cable Steering Kit
MOR308949-003 .	Suzuki Outboard Dual Cable Steering Kit
MOR308949-004 .	Yamaha Outboard Dual Cable Steering Kit



The Command 200 is a bolt-in replacement for the Teleflex Rack & Pinion version, with no additional holes to drill; and it is a functional replacement for all other single cable rack and pinion systems.

• The Command 290 is a drip-in replacement for the Teleflex Safe-T® and a functional replacement for the Teleflex Big-T® as well as all other single cable rotary systems.

• Quick and easy to install.

• Single or twin engines, inboards, outboards or stern drives.

• Both systems use high quality stainless steel output ends pioneered by Morse.

• Both the Command 200 and the Command 290 meet or exceed industry standards and are tested regularly by an independent lab to ensure compliance.

Morse Packaged Steering Systems

Complete Quality Steering Systems in a Box

A complete system for almost the price of a cable.

Complete steering systems include helm, cable, and 90° bezel. Available in 1 foot increments from 8 - 20 feet. Wheel not included.

• Bolt-in replacement for Morse and other steering systems with no new holes to drill.

• Quality cable with stainless output ends.

• Quick and easy to install.

System Component Part Numbers

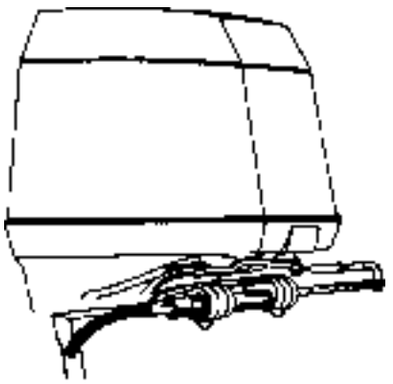
Stock #	Description
MOR309273-L	Command 290 Rotary Steering Package Order in 1 foot lengths from 8 to 18 feet
MOR309816-L	Command 200 Rack and Pinion Steering Package Order in 1 foot lengths from 8 - 20 feet.
MOR310663-L	Command 200 Twin Rack & Pinion Steering Package Order in 1 foot lengths from 10 to 17 feet.

Package Steering Systems Contain:

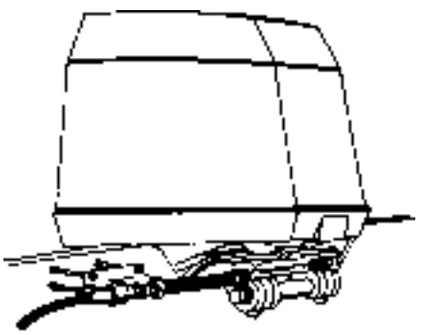
• Drive Assembly
• Bezel
• Cable

Command 200

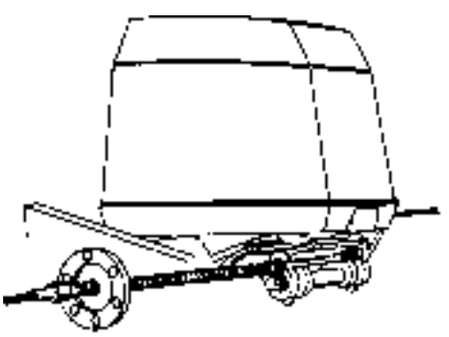
Command 290



Tilt Tube Mounting



Transom Support Mounting



Splashwell Mounting

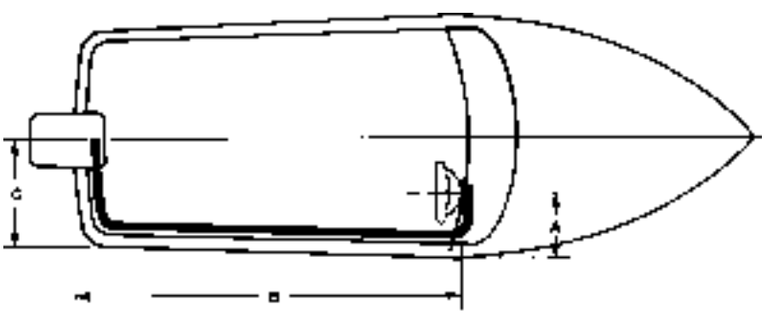
Replacement Steering Cables

For Morse Acco, DetMar, Mercury, OMC and Teleflex Steering systems.

Morse steering cables have been specifically developed for marine environments, time and cycle tested to last longer than ordinary steering cables. All cables have anticorrosive stainless steel output ends and a UV stabilized polyethylene outer jacket that resists premature aging.

How to measure for a steering cable installation.
An important component of steering function is proper cable installation. Since cable efficiency is reduced by the number of cable bends and the radii of those bends, it is essential to plan the straightest cable path possible. The total of cable bends should never exceed 360°, and no bend should be less than the recommended radius.

If cables must run through ribs, decks or motor well walls, holes should be drilled with adequate clearance. The cable should then be supported with ties or hangers approximately every six feet.



How to identify the proper replacement cable
Look for the Part Number
First remove the entire cable assembly from the boat to insure accuracy in measuring.

All steering cable manufacturers stamp a part number and cable length on the outer plastic jacket of each cable, but some can also be found on the opposite end. If the part number and length are legible, simply refer to the Steering Cable Cross Reference Index to find the proper Morse replacement cable number and order the length marked on the original cable.

A=Distance from the center line of the wheel to the gunwale.
+B=Distance from the dash to the transom.
+C=Distance from the gunwale to the center line of the transom or engine tilt tube.
Total=Basic Measurement.

Example: A=20"+B=104"+C=28"=152"
152"-8" for two 90° bends =144"
144+6" for a thru-tube installation=150"
Round up to nearest whole foot=156" (13 ft.)

The total of A+B+C is your basic measurement. From that total deduct 4" for every for every 90° bend in the cable. For installations through the engine tilt tube add 6". Then round the final total up to the next whole foot.

Example for Transom or Splashwall Mounted Installation:
A=20"+B=104"+C=28"=152"
152"-8 for two 90° bends=144"
144"-6" for transom installation=138"
Round up to nearest whole foot=144" (12 ft.)

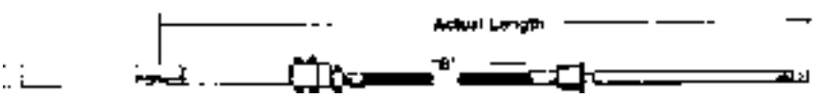
If the Part Number or length can't be found.

If for some reason the part number or length stamped on the outer jacket is not legible or cannot be determined, it will be necessary to examine the system to determine what type cable you have, and actually measure the length required for proper cable placement.

Morse has developed a quick method for measuring all cables to determine the correct length of the Morse replacement cable. Identify the type of system you have from the drawings on the following pages. Then simply measure the length of the outer plastic cable conduit "B" dimension. Depending on the specific cable manufacturer, the plastic conduit can be red, black, white, gray, or green.

Since the actual overall cable length is measured from the center of the steering wheel pinion shaft to the center of the cross hole on the output ram when it's at mid travel, Morse has developed a conversion figure for each system to compensate for the differences between manufacturer's systems.

Take the plastic conduit length ("B" dimension) you have measured and add the proper conversion factor (in inches). The conversion factor is found below the Morse Replacement Cables on the following pages. Round up the length to the nearest 1/2 or whole foot increment as indicated. The resulting length will be the proper length of the Morse replacement cable you need to order.

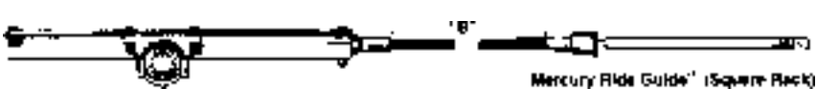


Example 1

If you are replacing a Morse Command 200 steering cable and your "B" dimension measures 122", you would add the 30" conversion factor for Command 200 replacement cables.
122"+30"=152"
Round up to the nearest foot.
152"+4"=156"=13' Command 200 replacement cable.

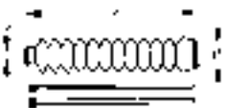
Example 2

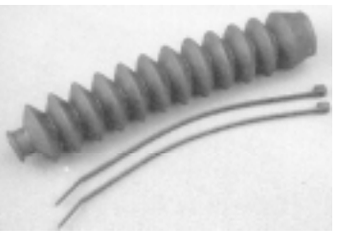
If you are replacing a Mercury® steering cable and your "B" dimension measures 124", you would add the 34" conversion factor for MRC replacement cables.
124"+34"=158"
Round up to the nearest 1/2 foot.
158"+4"=162"=13'6" MRC replacement cable.



Steering Cable Boot
Molded Rubber

Stock #	A	B	C	Weight	Pk.
SDG521700	8"	1"	3/8"	.13 lb.	10 ea.





Steering Cable Replacement Cross Reference Index

	Original Cable Part Number	Description	Morse Replacement Part Number	
	300001	Command 200/OEM	300620	Command 200
	300002	Command 200	300620	Command 200
	300619	Command 200/OEM Galv.	300620 or 300619	Command 200
	300620	Command 200 SST	300620 or 300619	Command 200
	300962	Command 250	312020	URC
	304411	Command 290/OEM	312020	URC
	304415	TRC	312020	URC
	308664	TRRC	308664	TRRC
	310505	SpiraSteer	310505	SpiraSteer
Uflex®	M47	T71, T72, T73NR, T74NR T81, T82, T83NR, T84NR	312020-000-LENGTH	URC
	M66	Safe-T® Quick Connect NFB Helms		
Teleflex®	SC-72	Big-T® & Safe-T®		
	SSC-72	Big-T® & Safe-T®		
	SC-106	Big-T® & Safe-T®		
	SSC-124	The Rack®		
	SSC-62	Safe-T® Quick Connect		
	SSC-62	NFB Helm		

Note: Morse Controls no longer manufactures replacement steering cables for the cables listed below. We recommend that the entire steering system be replaced by the Morse systems as indicated.

Acco®	56-8724	Mercury Ride Guide	309273	Command 290 System
	56-8263	Steermaster Mark III	309273	Command 290 System
	56-8226	Steermaster Mark II	309273	Command 290 System
DetMar®	4-440	Round Rack	309816	Command 290 System
	4-200	Square Rack	309816	Command 290 System
Mercury®	C-11111	Mercury Ride	309816	Command 290 System
	C-34451	Mercury Ride Guide	309816	Command 290 System
	C-76043	Mercury Ride Guide	309816	Command 290 System
	C-76876	Mercury Ride Guide	309816	Command 290 System
	C-11110	Mercury Ride Guide	309816	Command 290 System
OMC®	1719	OMC Rack & Pinion	309816	Command 290 System
	3805/200	OMC Rack & Pinion	309816	Command 290 System

ARC™ Steering Cable--A replacement cable for ACCO and Mercury rotary steering systems.

Stock #	Description
MOR305969-L	ARC Cable

ARC Cable Replaces

"B" Dimension+28"=Order Length (round up to nearest whole ft.) 8" minimum bend radius.

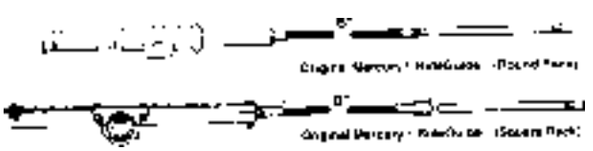
Replaces	Original Part No.
ACCO® Steermaster Mark III	56-8263
ACCO® Steermaster Mark II**	56-8226
Mercury® Ride Guide® Rotary	C-11110 or C-76886

**The use of ARC for ACCO® Steermaster Mark II P/N 56-8226 requires a new steering connection kit. See steering connection kit section.

MRC™ Steering Cable--A replacement cable for ACCO and Mercury rack and pinion steering systems.

Stock #	Description
MOR304860-L	MRC Cable

MRC Cable Replaces



"B" Dimension+34"=Order Length (round up to nearest 1/2 foot increment) 5" minimum bend radius.

Replaces	Original Part No.
ACCO®	56-8724
Mercury® Ride Guide®	C11111, C-76043, or C34451

DRC™ Steering Cable--A replacement cable for DetMar rack and pinion steering systems.

If DetMar helm and cable need replacement, the Morse Command 200 or 200 Tilt rack and pinion steering sytem can be easily substituted.

Stock #	Description
MOR305013-L	DRC Cable

DRC Cable Replaces

"B" Dimension+32"=Order Length (round up to nearest whole ft.) 8" minimum bend radius.

Replaces	Original Part No.
DetMar® Round Rack	4/440
DetMar® Square Rack	4-200

The DRC cable will fit either the DetMar round rack or square rack by ordering a round or square rack attachment kit when you order the cable.

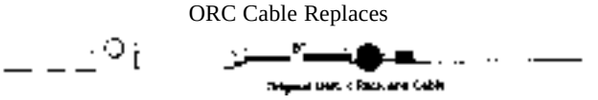
Stock #	Description
MOR304934	DetMar® Round Rack Kit
MOR304935	DetMar® Square Rack Kit

ORC™ Steering Cable--A replacement cable for OMC thru-transom rack and pinion steering systems

This system has been discontinued by OMC. If OMC helm and cable assembly needs replacement, substitute with complete Morse Command 200/OMC System. No attempt should be made to disassemble a Morse Command 200/OMC rack & cable assembly (P/N 300298) for use with OMC rack system (P/N 1719--). The cables are not interchangeable and may cause a steering cable malfunction.

Stock #	Description
MOR305304-L	ORC Cable

ORC Cable Replaces



"B" Dimension+30"=Order Length (round up to nearest whole foot) 5" minimum bend radius.

Replaces:	Origianl Part No.
OMC Thru-Transom Rack & Pinion Cable Only	1719--

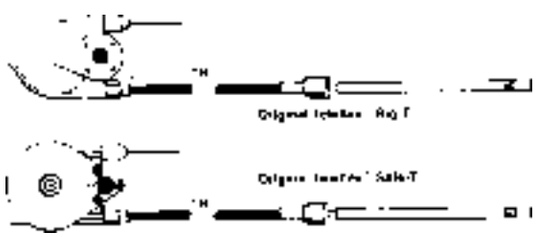
MORSE CONTROLS

TRC™ Steering Cable--A replacement cable for Teleflex Inc. (U.S.) rotary steering systems.

If a Big-T® or Safe-T® helm needs replacement, the Morse Command 290 or 290 Tilt helms fit existing mounting cutouts for Safe-T® and easily substitutes for Big-T®.

Stock #	Description
MOR304415-L	TRC Cable

TRC Cable Replaces



"B" Dimension+23"=Order Length (round up to nearest whole ft.) 8" minimum bend radius.

Replaces:	Original Part No.
Teleflex® Big-T®, Safe-T®	SC-72
Teleflex® Big-T®, Safe-T®	SSC-72
Teleflex® Big-T®, Safe-T®	SC-106

TRRC™ Steering Cable--A replacement cable for Teleflex Inc. (U.S.) rack and pinion steering system.

If the Teleflex® Rack Helm needs replacement, the Morse Command 200 or 200 Tilt Rack and Pinion steering system easily substitutes.

Stock #	Description
MOR308664-L	TRRC Cable

TRRC Cable Replaces

"B" Dimension+30"=Order Length (round up to nearest whole foot) 5" minimum bend radius.

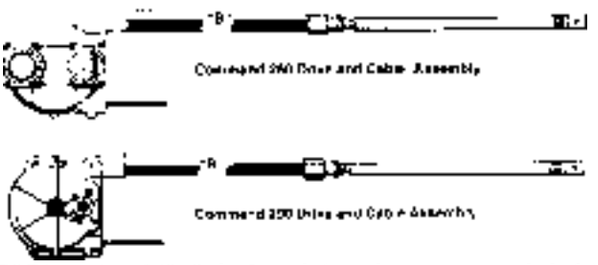
Replaces:	Original Part No.
*Teleflex® The Rack Cable	SSC-124

Command 250, 290 Steering Cables--A replacement cable for Morse Controls rotary steering systems.

If Command 250 helm and cable need replacement, substitute Command 290 or 290 Tilt System.

Stock #	Description
MOR304415-L	TRC Cable

TRC Cable Replaces



"B" Dimension+24"=Order Length (round up to nearest whole ft.) 8" minimum bend radius.

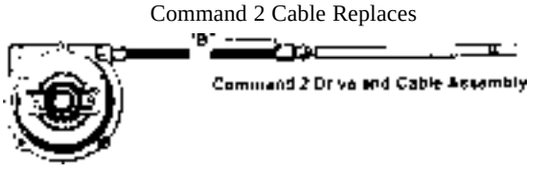
Original Replaces	Part No.
Morse Command 250 Cable	300962
Morse Command 290 and 290 Tilt cable	304411
Morse 290 and 290 Tilt/TRC	304415

Command 2 Steering Cable

For Morse Command 2 rotary steering.

Stock #	Description
MOR300622-L	Command 2 steering cable

Command 2 Cable Replaces



"B" Dimension+22"=Order Length (round up to nearest whole foot) 5" minimum bend radius.

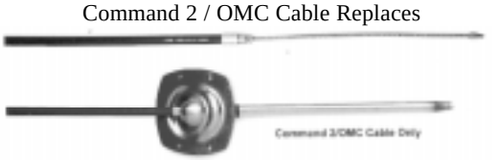
Replaces:	Original Part No.
Morse Command 2	MOR68764
Morse Command 2 / OEM	MOR300621
Morse Command 2	MOR300622
Morse Command 2 / OEM	MOR300623
Morse Command 2	MOR300624

Command 2 Steering Cable

For Thru-transom OMC version

Stock#	Description
MOR67820-L	Command 2/OMC cable

Command 2 / OMC Cable Replaces



"B" Dimension+23"=Order Length (round up to nearest whole foot) 5" minimum bend radius.

Replaces:	Original Part No.
Morse Command 2 / OMC	MOR67820

Command 200 Steering Cable

For Morse Cammand 200 rack and pinion steering.

Stock #	Description
MOR300620	Command 200 steering cable

"B" Dimension+30"=Order Length (round up to nearest whole foot) 5" minimum bend radius.

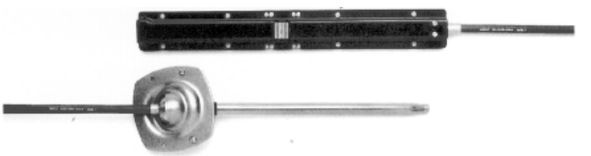
Command 2 / OMC Cable Replaces

Replaces:	Original Part No.
Morse Command 200/OEM	MOR300001
Morse Command 200	MOR300002
Morse Command 200/OEM	MOR300619
Morse Command 200	MOR300620

Command 200 Steering Cable

For Thru-transom OMC version

Stock #	Description
MOR300298-L	Command 200 / OMC cable



"B" Dimension+30"=Order Length (round up to nearest whole foot) 5" minimum bend radius.

Command 200 / OMC Cable Replaces

Replaces:	Original Part No.
Morse Command 200/OEM	MOR300001
Morse Command 200	MOR300002
Morse Command 200/OEM	MOR300619
Morse Command 200	MOR300620

Aqua Power Steering Wheels

Available in four contemporary styles.

- Ergonomically designed.
- UV ressitant.
- Easy to install.
- Can be removed without a wheel puller.

Stock #	Description	Diameter
AQP8021B	Quest	13"
AQP8031	Apex	13"
AQP8041	Legacy	14"
AQP8043	Legacy Sport	14"

AQP8021B

AQP8041

AQP8031

AQP8043

Destroyer Type Wheels

Schmitt Model 150-Destroyer 6 Spoke, 10° Dish, Brown Wood Center.

3/4" Morse / Teleflex Taper

Stock #*	Dia	Spoke Dia
SHM152-15-111 ...	15"	3/8"
SHM152-16-111 ...	16"	3/8"
SHM152-18-111 ...	18"	3/8"
SHM152-20-111 ...	20"	3/8"
SHM152-22-111 ...	22"	3/8"
SHM152-24-111 ...	24"	3/8"

1" Straight Bore w/Key

Stock #*	Dia	Spoke Dia
SHM152-15-117 ...	15"	3/8"
SHM152-18-117 ...	18"	3/8"
SHM152-20-117 ...	20"	3/8"
SHM152-24-117 ...	24"	3/8"

*Other options are available.

Steering Wheel

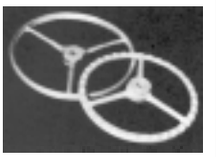
Baywood

3/4" Morse / Teleflex Taper

Stock #	Dia.	Wt.
BAYB-78-12	12"	2 lbs. 7 oz.
BAYB-79-14	14"	2 lbs. 14 oz.

1" Straight Bore with Key

Stock #	Dia.	Wt.
BAYB-78-121	12"	2 lbs. 7 oz.
BAYB-79-14S	14"	2 lbs. 14 oz.



- cast marine grade aluminum
- bored and keyed as specified

Understanding Mechanical Advantage

By design, every control has a specific mechanical advantage factor. Simply stated, mechanical advantage means that because you are using a lever to create motion at the other end of a control system (move the throttle or shift mechanism on the engine itself) it requires less effort at the control handle than it would if you were pushing directly on the engine's throttle or shift mechanism.

As an example, if an engine required 15 lbs. of force to move its shift lever and you were using a control with a mechanical advantage of 2.77, you would divide the force by the mechanical advantage to determine how much effort must be exerted at the control lever handle to create the needed 15 lbs. of force.

Force
---------- = force required at the control lever
Mechanical Advantage

15 lbs.
---------- = 5.42 pounds of force required at the control lever.
2.77

Understanding a control's mechanical advantage and the amount of force to be overcome at the engine is very important when specifying the appropriate control.

Control Head Mountings

A final choice in engine control styles is the type of mounting. Morse Controls makes a wide variety of controls so that the boat owner can tailor the control to the boat's exact needs and their own preferences.

Single function control, single engine

Dual function control, single engine

Multiple Station Installations

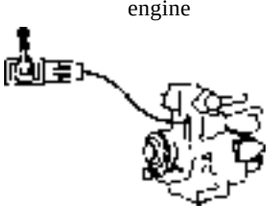
Dual or multiple station applications almost exclusively use single-function two lever controls. There are two basic system designs recommended for multiple stations. One is the parallel system and the other is the series system.

The parallel system consists of cables from each control station running all the way to the clutch and throttle at the engine. This configuration is utilized when cable runs are relatively short and direct.

An option for use with parallel dual stations is a transfer unit. A transfer unit permits the two clutch and/or the two clutch cables from the controls to be connected to a single cable leading aft to the engine. Transfer units are used where long or difficult cable paths make parallel installations costly or difficult to operate.

In a series control system, the cables run from controls to the lower station controls, and then to the engine. This method is generally used for longer, more difficult cable runs.

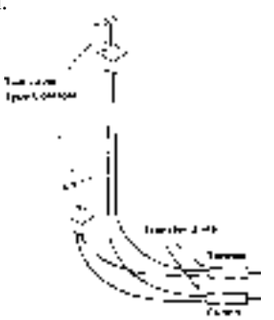
When to utilize a parallel system or a series system is dictated by the total degrees of bend in the cables as measured by the sum of the degrees of all bend radii. Thisdirectly affects the efficiency of cable action. The configuration that gives the control system the fewest degrees of bend is the one that should be empolyed.



Single function control, auxillary engine

Dual function controls, twin engine

Single function controls, twin engine



Parallel system using transfer units

Boat Type	Mechanical Dual Function Controls Shift and throttle in the same lever			
	SL-3 Top Mount	SL-3 Side Mount	MT-3	MV-3
Outboard & sterndrive single station	•	•	•	•
Outboard & sterndrive dual station	–	–	–	–
Inboard single station	•	•	•	•
Inboard dual station	•8	•8	•8	–
Jet boats	–	–	–	•
Sailboats	•456	•456	•456	•456
Commercial	•	•	•	•
Control Features				
Neutral safety switch to prevent starting in gear	•	•	•	•
Neutral interlock to prevent accidental shifting	–	•	–	•
Engine warm-up provision	•	•	•	•
Adjustable throttle brake	•	•	–	–
Trim & tilt switch	o	o	–	–
Forward neutral reverse detents	•	•	•	•
Adjustable travel stops	–	–	–	–
Applicable for dual stations	•	•	•	•
Control Cables Used				
33C/33C Supreme	•	•	•	•
Morse KM (Mercury Type)	•	•	–	–
Morse OS (OMC Type)	•	•	–	–
40 Series Cables	–	–	o	o8
60 Series Cables	–	–	–	–
Index to Page #'s	M-24	M-24,25	M-26	M-27

• Yes
o Optional
– No
1 SG with interlock only
3 MY dual station use with 61371 transfer unit only
4 Sailboat with outboards
5 Sailboat with inboard hydraulic transmission
6 Sailboat with inboard cone clutch
7 Jet versions only (shift)
8 Use 311262 dual station transfer unit

Mechanical Single Function Controls Shift and throttle in separate levers					Level Operated Electronic Throttle Control		Electronic Throttle Control	Electronic Shift & Throttle Control
Twin S	Twin SR	SG	MY	ST	ETC	ETC	ETC	KE/4
•	•	•1	•1	–	–	–	–	•
•	•	•1	•1	–	•	•	•	•
•	•	•	•	•	•	•	•	•
•	•	•	•3	–	–	–	•	•
–	–	–	–	–	–	–	–	–
•5	•5	•5	•5	•5	–	–	–	•
•	•	•	•	•	•	•	•	•
○	○	•	•	–	–	–	–	•
–	–	○	–	–	–	–	–	•
–	–	–	–	–	–	–	–	•
•	•	•	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–
○	○	•	•	–	–	–	–	•
•	•	•	–	–	–	–	–	•
•	•	•	•3	–	–	–	–	–
•	•	•	•	•	•	•	–	–
–	–	•	–	–	–	–	–	–
–	–	•	–	–	–	–	–	–
○	○	–	–	○	•	•	–	–
–	–	–	–	–	•	•	–	–
M-28	M-29	M-32	M-30,31	M-33	M-35	M-35	M-35	M-36 to 39

N - Neutral only

NOTE: Single function controls in dual station should use shift detents at main operating station only

MT-3 Control

Dual-function, single-lever control.
This sturdy, traditionally styled top-mounted control provides one-handed positive engine control with excellent feel characteristics. Start and warm-up are done by pulling out the hand levers in the neutral position. This disengages the clutch and allows throttle to be advanced in neutral. Returning to neutral detent reengages clutch.

Stock #	Description
MOR308601	MT-3 Single
MOR308602	MT-3 Twin

Accessories and Parts

Stock #	Description
MOR32778-002	Hand Lever
MOR308598-001	Chrome Side Plate, MT-3
MOR35232-001	Ball Knob, Red
MOR38853	Decal, FWD-NEU-REV
MOR305499	Neutral Safety Switch, MT-3
MOR308599	Hardware Mounting Bag, Single, MT-3
MOR308727	Hardware Mounting Bag, Twin, MT-3
MOR308742	H.D. Conversion Kit (single only), MT-3
MOR301585	OMC Replacement Switch
MOR62478	Evinrude/Johnson replacement switch
MOR32898-002	Chrome Side Plate, MT-2
MOR67925	Neutral Safety Switch, MT-2
MOR67976	Hardware Mounting Bag, Single, MT-2
MOR67977	Hardware Mounting Bag,Twin, MT-2
MOR67991	H.D. Conversion Kit (single only), MT-2

MV-3 Control for Jet Boats and Ski Boats

Dual-function, single-lever control
The MV-3 is the choice of competetive ski boat and jet boat enthusiasts. It provides single-lever control of both shift and throttle.
- Fits all popular outboards, inboards and sterndrives
- Emergency cut-off feature available for most popular MV-3 models
- Crisp, positive detents
- Pullout clutch disengagement feature for engine warm-up with automatic disengagement
- Neutral interlock feature to prevent accidental shifting
- Mechanical advantage - Shift 2.9:1 / Throttle 3.20:1
- Uses Morse 33C and 33C Supreme Cables
- Uses 40 Series Cables for Berkeley Jet and Mercury 175HP Jet

MV-3

Stock #	Old MV2 #	Description
MOR311335	306490	MV-3 Competition Ski Boat Version (no safety switch) forward cable entry
MOR311364	306950	MV-3 Standard Control with neutral safety switch and aft cable entry

MV-3 For Jet Boats

Stock #	Old MV2 #	Description
MOR311412	306951 ..	MV-3, right mount, Berkeley
MOR311413	306952 ..	MV-3, left mount, Berkeley

Accessories & Parts

Stock #	Description
MOR35232-004	Ball Knob, Black
MOR35232-005	Ball Knob,White
MOR61700	MV-2, Neutral Safety Switch Kit (Berkeley)
MOR306494	MV-2 Hand Lever Assembly
MOR300928	Neutral Safety Switch Replacement
MOR301585	OMC Replacement Switch

Matching Control Cables
33C Supreme, high efficiency cable.
33C Red-Jaket, industry standard cable.
43BC for Berkeley jet shift lever

SL-3 Control

Dual function, single lever.
A snap to install and a perfect match with any engine; outboards, inboards or sterndrives. Attractive and extremely simple in design, the SL-3 is specifically engineered for installation without control modifications or tedious cable adjustments.
Every feature you need for maximum control and convenience.
•Firm yet effortless shift and throttle motion
•Entire gear mechanism is enclosed and permanently lubricated for long-lasting, smooth operation.
•Port or starboard installation with various cable entry angles.
•Easily adapted to push or pull mode without tools
•"Easy-On" cable design means no shift or throttle adjustments, no control modifications, and accepts virtually every type cable
•Push button for neutral engine warm-up
•Trim switch in handle grip for one handed operation
•Neutral interlock prevents starting in gear
•Adjustable brake prevents throttle creep
•Mechanical advantage 2.38:1

Stock #	Description
MOR309473	Side mount standard
MOR309476	Top mount single standard
MOR309479	Top mount twin standard

S and Twin S Controls

Single-function, one or two lever.
S controls are carefully manufactured with highly polished corrosion resistant chrome plated brass covers. They have high strength forged chrome plated levers, with stainless steel hanger plates.

Stock #	Description
MOR31001-001	Twin S
MOR31002-001	Single S

Accessories

Stock #	Description
MOR22328	Clutch Detent Kit
MOR35232-001	Ball Knob--Red
MOR35232-004	Ball Knob--Black
MOR36773	Lever Extension
MOR39489-002	Series Dual Station Kit--Twin S
MOR42152	Series Dual Station Kit--40 Series--(2 required for twin)
MOR47307	Neutral Safety Switch
MOR48413	OMC Electric Shift Kit
MOR61001	Hardware Mounting Bag--Twin
MOR301585	OMC Replacement Switch Only
MOR306997	Throttle Hold Kit

SR and Twin SR Controls

The SR Controls have a polished stainless steel cover, marine grade chrome levers and rugged cast hanger plate. The removable cover enables easy access to the control mechanism for maintenance, as well as adjustment of stops and brakes.

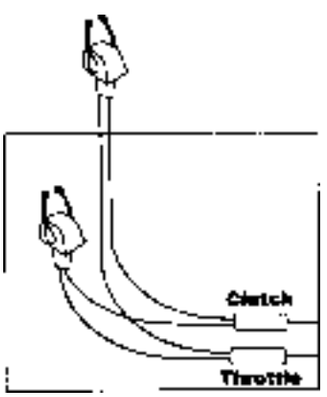
Stock #	Description
MOR36468-001	SR Single
MOR36469-001	SR Twin

Accessories

Stock #	Description
MOR35232-001	Ball Knob-Red
MOR35232-004	Ball Knob-Black
MOR36326	Hand Lever Only
MOr36774	Clutch Detent Kit
MOR39490-002	Series Dual Station Kit-Twin
MOR40090	43C Adapter Kit
MOR41117	Neutral Safety Switch
MOR47682	Twin Cover
MOR48262	Single Cover
MOR48501-002	Series Dual Station Kit--40 Series--Twin
MOR60989	Hardware Bag--Single
MOR60991	Hardware Bag--Twin
MOR301585	OMC Replacement Switch

When S and SR Two Lever Controls are used in a parallel, dual station application cable routings or too small a cable bend radius may cause the clutch or throttle levers to operate "stiff" or "bumpy".

Adding a transfer unit and substituting 33C "Supreme" cables for standard 33C cables can improve control performance.

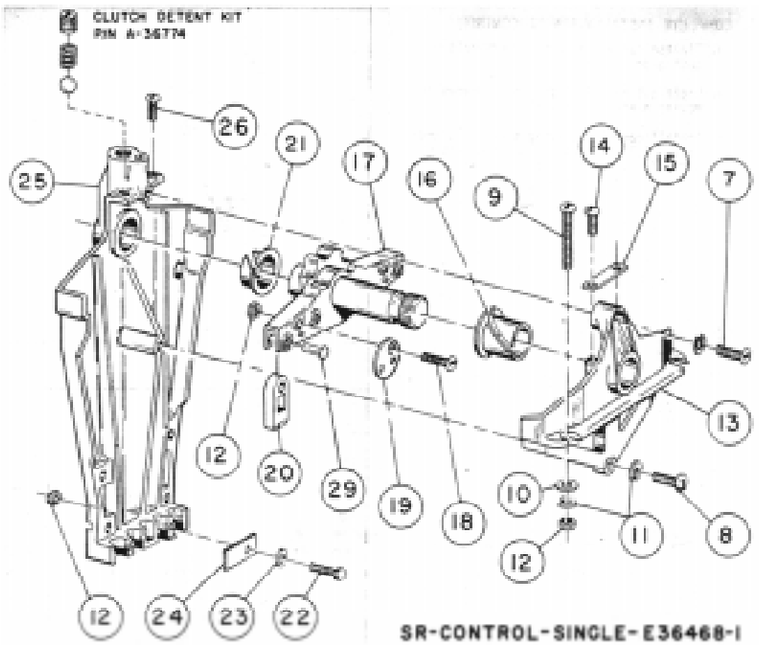


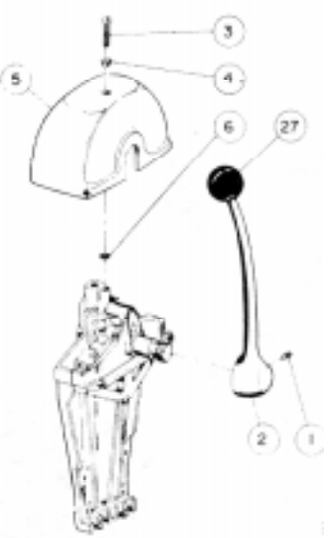
Dual Station Transfer Unit

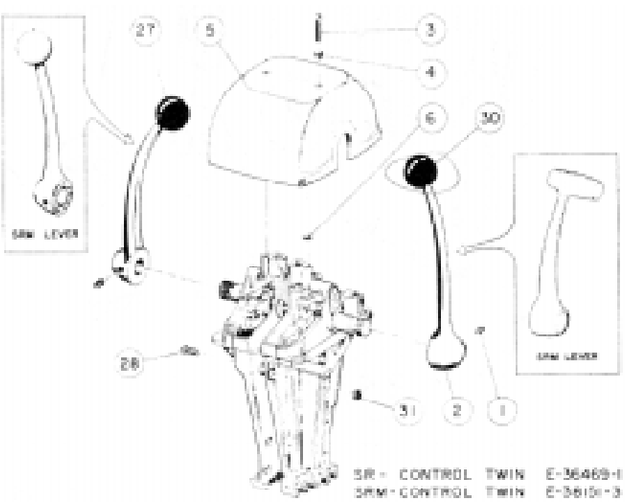
For S & SR Two Lever Control Systems
The Morse dual station transfer unit is ideal for parallel dual station installations when two-lever single function controls are used. The transfer unit allows two clutch or two throttle cables to be connected to a single cable leading aft to the engine.

These units are recommended for installations with long or difficult cable paths to eliminate undesirable cable bends that cause cable backlash and reduced efficiency.

Stock #	Description
MOR61371	Transfer Unit--33C and 33C Supreme Cables Only & Parallel Systems Only

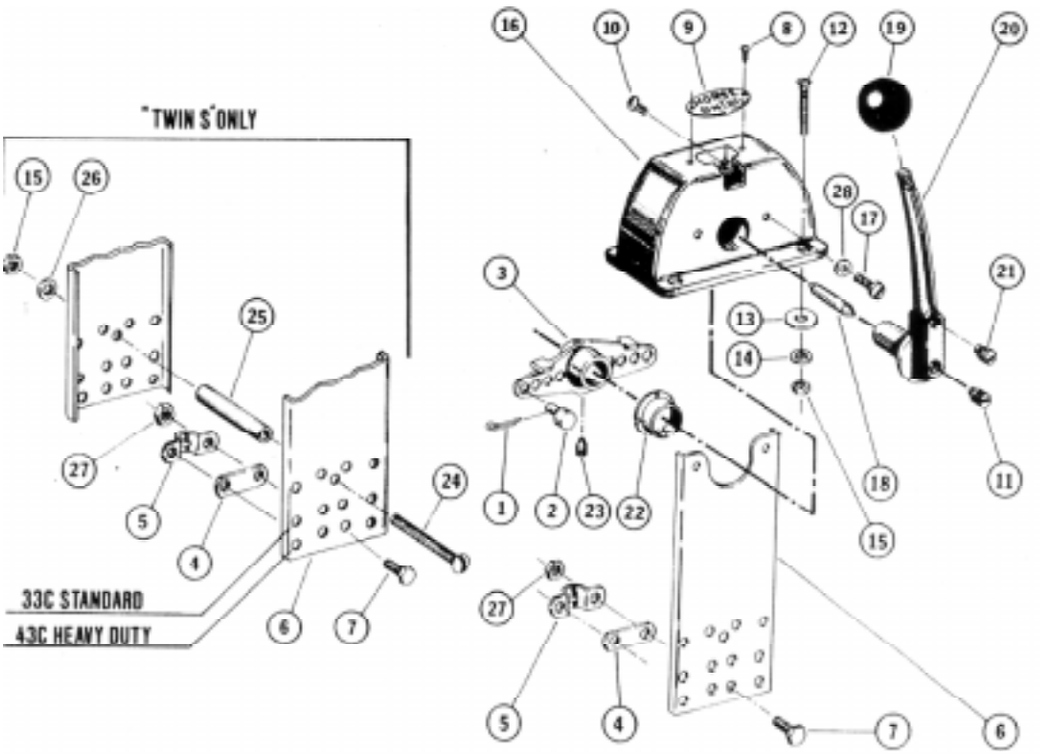




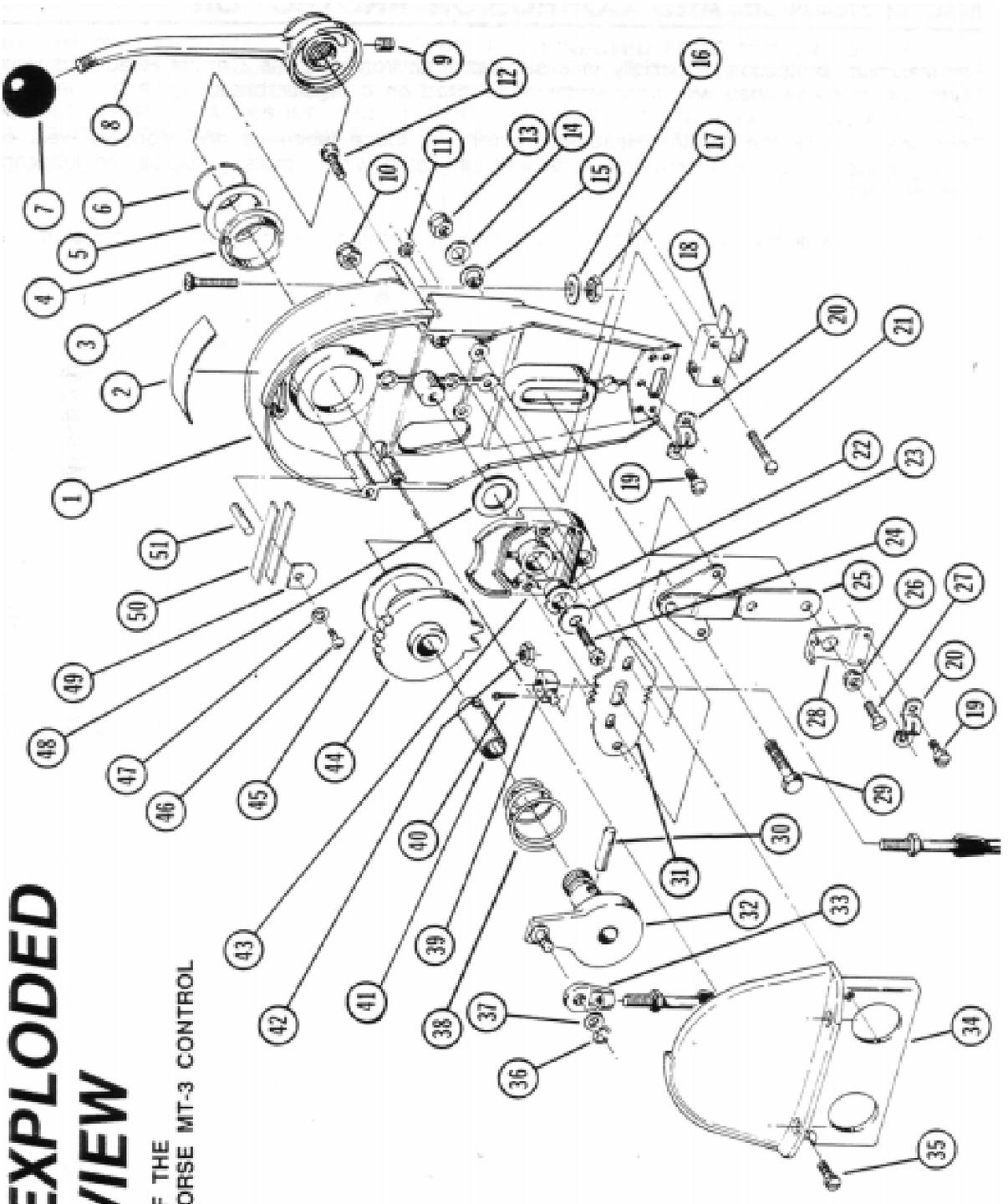


ITEM No.	DESCRIPTION	No. Req'd. SR	No. Req'd. SR TWIN	Part No.
1	Setscrew 5/16-18 x 3/8	1	2	A50414-004
2	Hand Lever SR	1	2	E36526
	Hand Lever SRM - BALL TYPE	-	1	E38146
	Hand Lever SRM - BARREL TYPE		1	E38145
3	Screw-Dual Hd. Mach. #10-24 x 1/2"	1	2	A50127-046
4	Washer, Seal	1	2	A36554
5	Cover (Twin only)		1	047482
	Cover (Single only)	1		048767
6	O-Ring	1	2	A51200-018
7	Screw, Rd. Hd. Mach. #10-24 x 5/8" lg.	6	12	A50145-062
8	See Item #7	-	-	---
9	Screw Rd. Hd. Mach. #10-32 x 1-1/2" lg.	3	4	A50145-610
10	Washer, Flat, 7/32 I.D. x 1/2 O.D. x 1/16 thk.	3	4	A50800-052
11	Lockwasher, Split #10	3	8	A50801-311
12	Nut, Finished Hex #10-32	5	10	A50905-078
13	Bearing Housing	1	2	E36298

ITEM No.	DESCRIPTION	No. Req'd. SR	No. Req'd. SR TWIN	Part No.
14	Brake Screw (see Item #7)	-	-	---
15	Brake Tension Strap	1	2	A36356
16	Nylliner - 3/4 I.D. x 3/4 lg.	1	2	A62947
17	Control Arm Shaft	1	2	E36299
18	Screw, Bind Hd. Mach. #10-32 x 1/2" lg. *Torq Patch	1	2	A3606102
19	Retainer	1	2	A3606562
20	Cable Terminal	1	2	A3606561
21	Nylon Bearing	1	2	A32660
22	Screw, Hex Hd. Mach. #10-32 x 3/4" lg.	1	2	A50406-662
23	Washer, Bowed	1	2	A32320
24	Cable Retaining Plate	1	2	A36350
25	Main Housing	1	2	E36300
26	Stop Screw (see Item #7)	-	-	---
27	Ball Knob (Black)	1	1	A35232-4
28	Screw, Fil. Hd. Mach. #10-32 x 5/8 lg.	1	2	A50112-662
29	Pin	1	2	A51100-300
30	Ball Knob (Red)	-	1	A35232-1
31	See Item #12	-	-	---



ITEM NO.	DESCRIPTION	NUMBER REQUIRED "S"	NUMBER REQUIRED "TWIN S"	PART NUMBER
1	Cotter pin, brass 3/32" dia. x 1/2	1	2	COMMERCIAL
2	Cable terminal (33C)	1	2	31029
3	Operating lever	1	2	32634
4	Shim	1	2	31538
5	Cable clamp (33C)	1	2	31509
6	Hanger plate	1	2	32637
7	Hex hd machine screw #10-32 x 3/4	2	4	COMMERCIAL
8	Rd head machine screw #6-32 x 1/4	2	2	COMMERCIAL
9	Nameplate (single)	1		21256
	Nameplate (twin)		1	13251
10	Rd hd machine screw #10-32 x 1/2"	2	4	COMMERCIAL
11	Brake setscrew	1	2	35297
12	Oval hd mach screws #10-32 x 1-1/2"	4	4	COMMERCIAL
13	Flat washer #10	4	4	COMMERCIAL
14	Split lockwasher #10	4	4	COMMERCIAL
15	Hex nut, #10-32	4	5	COMMERCIAL
16	Housing, single	1		31030
	Housing, twin		1	31031
17	Fill hd machine screw #10-32 x 3/8"	2	4	COMMERCIAL
18	Brake Pin, single	1		31039
	Brake Pin, twin		1	31036
19	Knob, black	1	1	25232-2
	Knob, red		1	25232-1
20	Hand lever	1	2	21572
21	Retaining screw, detent	1	2	25319
22	Bearing	1	2	32660
23	Tapered locking setscrew	1	2	29999-091
24	Rd hd machine screw #10-32 x 2-1/2		1	COMMERCIAL
25	Spacer, twin		1	31034
26	Internal tooth lockwasher #10		1	COMMERCIAL
27	Hex nut #10-32	2	4	COMMERCIAL
28	Fiber washer	2	4	41640



Seattle: (206) 285-5010 Fax: (206) 285-7925
Website: http://www.seamar.com
Call Toll Free: (800) 426-2783 8-5 M-F 9-1 Sat.
email: seamar@seamar.com

ITEM	QUANTITY	DESCRIPTION	PART NUMBER
1	1	HOUSING, CHROME	308592
2	1	DECAL - "FWD - REV"	38853
3	4	OVAL HEAD SCREW, #10-24 x 1.50 LONG	COMMERCIAL
4	1	DRIVE GEAR BEARING	32786
5	1	KEYED WASHER	32787
6	1	SPUT RING	32794
7	1	RED BALL KNOB	35232-001
8	1	HANDLE	32778-002
9	1	HEX SOCKET SETSCREW, 5/16-18 x 1/2 LONG	COMMERCIAL
10	1	HEX ELASTIC STOP NUT, #10-32	COMMERCIAL
11	2	HEX NUT, #4-40	COMMERCIAL
12	1	FILLISTER HEAD PHILLIPS SCREW, #10-24 x 1.00 LONG	COMMERCIAL
13	1	HEX ELASTIC STOP NUT, 1/4-28	COMMERCIAL
14	1	1/4 FLAT WASHER	32194
15	1	COLLAR	32963
16	4	#10 FLAT WASHER (.203 ID x .56 OD x .040 THK)	50800-802
17	4	HEX NUT, #10-24	COMMERCIAL
18	1	NEUTRAL SAFETY SWITCH	51801-023
19	4	FILLISTER HEAD SCREW, #10-24 x .31 LONG	COMMERCIAL
20	2	CABLE CLAMP	32010
21	2	ROUND HEAD SCREW, #4-40 x .62 LONG	COMMERCIAL
22	1	SHIFT BEARING	32020
23	1	THRUST WASHER	308589
24	1	ROUND HEAD SCREW, #10-32 x 1.00 LONG	COMMERCIAL
25	1	LINKAGE ASSEMBLY	308586
26	1	SHOULDER BUSHING	48676
27	1	FLAT HEAD SLOTTED SCREW, 1/4-28 x 1.00 LONG	COMMERCIAL
28	1	SWIVEL BRACKET	32011
29	2	HEX HEAD SCREW, 1/4-28 x .62 LONG	50414-030
30	1	GROOV-PIN, TYPE 5, .187 DIA. x 1.38 LONG, SST	51015-901
31	1	SHIFT ARM	308596
32	1	THROTTLE ARM ASSEMBLY	67954
33	1	CABLE TERMINAL	300646
34	1	SIDE COVER	308598
35	1	FILLISTER HEAD PHILLIPS SCREW, #10-24 x .62 LONG	COMMERCIAL
36	1	E-RING, .312 NOMINAL	51304-135
37	1	FLAT WASHER, .328 ID x .56 OD x .062 THK	50800-843
38	1	CONICAL SPRING	32790
39	1	CABLE PIVOT	304919
40	1	COTTER PIN, .093 x .50 LONG, BRASS	COMMERCIAL
41	1	THROTTLE ARM BEARING	32788
42	1	HEX JAM NUT, #10-32	32029
43	1	SHIFT GEAR	308587
44	1	DRIVE GEAR	308593
45	1	WAVED WASHER	32198
46	1	ROUND HEAD SCREW, #10-24 x .31 LONG	COMMERCIAL
47	1	#10 INTERNAL TOOTH LOCKWASHER	COMMERCIAL
48	1	SPACER WASHER	308594
49	1	DETENT RETAINER CLIP	32785
50	2	FLAT SPRING	302197
51	1	DETENT ROLLER	302195

MORSE CONTROLS

Limited to Remaining Stock on Hand

MD-24 Control System

Dual-function, single-lever control system

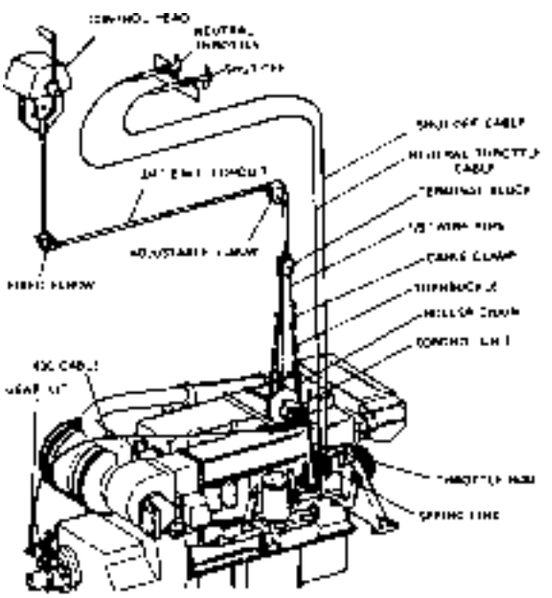
The MD-24 system minimizes lost motion and eliminates leakage problems associated with air and hydraulic systems. The system is comprised of three sections: pilot house control, enclosed cable over pulley system, and engine control unit.

•Mechanical advantage - shift 3.28:1/throttle 2.18:1

Stock #	Description
MOR47877	MD-24 Single Control
MOR47966	MD-24 Twin Control

System Components

Stock #	Description
MOR47877	MD-24 Single Control Head provides shift and throttle for one engine.
MOR47966	MD-24 Twin Control Head provides shift and throttle for twin engines.
MOR28126	90° Aluminum Cable Elbows. For use with standard 3/4" E.M.T. thin wall conduit. Number needed depends on specific routing requirements.
MOR28135	Engine Control unit. One required per engine. Includes sprocket and chain, chain connecting hardware, turnbuckles, strut, ball joints, gear unit, and mounting hardware.
MOR28190	Terminal block for use with 3/4" E.M.T. thin wall conduit. One required for use with each engine control unit. Depending on number of control stations, additional terminal blocks may be required.
MOR28796	Spring link is required between Engine Control Unit and governor or throttle lever on engine. Spring Link keeps the engine at idle speed throughout the shift range and is necessary for neutral throttle function.
MOR28984	Chain and Sprocket. Includes sprocket, chain and cable connectors; mounts on engine control unit, used when adding a second control station. May also be used on a 3/4" jackshaft for multiple stations.
MOR30359	Sprocket Only
MOR29101	Engine Room Hand Lever. Mounts on engine control unit, permits control at engine room--not required with pilot house disconnect.



Single Engine Single Station with neutral throttle and shut off controls

MD-24 System Applications

Typical MD-24 Installations:

The MD-24 control system is easily adaptable for single, dual and even triple station installations with single or twin gasoline or diesel engines with hydraulic reverse gears. The following examples are but a few of the many adaptations possible.

Multiple Stations

An MD-24 system can have several control stations simply by connecting all the stations to a common jack shaft and running one cable-over-pulley system to each engine as shown above. In most cases, standard Morse chain and sprocket assemblies may be used. Shafts, pillow blocks, etc., should be obtained locally.

Two Lever with Omega Reverse Gear

MD-24 is set-up as a two lever control system with the Twin Disc Omega reverse gear. Note a standard single function control such as the SR can be substituted for the throttle utilitzing a Red-Jaket® push-pull cable.

Twin Engines

Twin engines can be easily controlled with one hand when using a Morse heavy duty system.

MD-24 (cont)

Stock #	Description
MOR29120	Pilot House Disconnect. Replaces sprocket on Engine Control Unit, unit allows engine to be controlled at engine room without operating pilot house control. Has two sprockets, ideal for dual stations. Includes engine room hand lever.
MOR29136	Wire rope. For MD-24 cable over pulley system 1/8" 7x19 stainless steel, government specification MIL C-5424 -- specify length in feet.
MOR43193	Adjustable stainless steel, cable elbow (0°-180°). For use with 3/4"E.M.T. (.922 O.D.) thin wall conduit. Number needed depends on specific routing requirements.
MOR43820	Neutral Throttle Cable. A twist of the "T" handle locks throttle in any setting to provide separate remote control of throttle for engine warm-up or to operate auxillary equipment. May also be used for engine shut-off. Specify in five foot lengths when ordering. Bulkhead or clamp hub kit may be required. Also see Model DC control.

MORSE CONTROLS

MOR43384	Cable Conduit Divider. Simplifies threading wire rope through system, prevents cable crossovers. For use with 3/4" E.M.T. thin wall conduit. Specify length required.
MOR44842	43C Clutch Cable Connection Kit. Connects 43C clutch cable to gear unit, simplifies installation. Proper 43C clutch connection kit required. See connection kit section.
MOR45278	Chain Assembly. Includes chain and connectors, for use on second sprocket of pilot house disconnect.

Hardware

Stock #	Description
MOR29132-001	Clevis, 5/16-24 thread
MOR37664	Cable Clamp, for neutral throttle or shut off cable.
MOR50918-002	Wire Rope Clamp, "U" bolt . type
MOR28642	Chain to cable connector
MOR29094	Turnbuckle
MOR29108	Ball Joint, 5/16-24 thread.

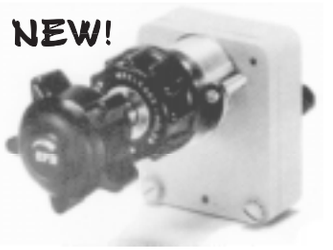
Call Seattle Marine Toll Free: 800-426-2783

MJB Control

The MJB is used for shift and throttle on sailboats. A clean sleek control, the MJB is made from chrome plated bronze to resist corrosion.

Stock #	Description
MOR44716-001	MJB Control

MORSE CONTROLS



Electronic Throttle Control

For DDEC I, II, III and Caterpillar Engines

Now there's an electronic throttle control designed specifically for electronically controlled marine engines. The new Morse ETC. Perfect for engine room locations, the ETC Speed Control functions as a throttle when the engine must be controlled from a location remote from the helm. Excellent for engine warm up and servicing needs. The ETC Speed Control is simple to install and features an easily adjustable locking collar designed to maintain the required engine speed.

Stock #	Description
MOR305662	Electronic Throttle Control

ST and STB Control

Single-function, one-lever.

The ST and STB are economical, durable, throttle controls with a heavy chrome finish. The STB control has a throttle brake, and can be used to shift Berkerley jets when foot throttle is used.

Stock #	Description
MOR31791	ST Control
MOR39115	ST-HD Control
MOR44777	STB w/external brake
MOR45978	STB-HD w/external brake

Accessories and Parts

Stock #	Description
MOR31765-002	Hand Lever Assembly--Chrome
MOR35232-004	Ball Knob--Black
MOR44386	Cable Brake--Throttle
MOR61688	Hardware Bag--STB--HD
MOR62279	Hardware Bag--STB

DC Control

For throttle choke or fuel shutdown.

The model DC Control is recommended for throttle choke, air or fuel shutdown, as well as governor or valve control. The DC can be mounted flush on the dashboard or the side of the wheel box. Mounting with the chrome plated angle bracket is optional.

Stock #	Description
MOR301916	DC Control
MOR48210	Mounting Bracket

TL Control

Single-function, two lever

•Economical side mount control for small boats

•Adjustable throttle brake prevents throttle creep

•Surface mount, no cutouts required

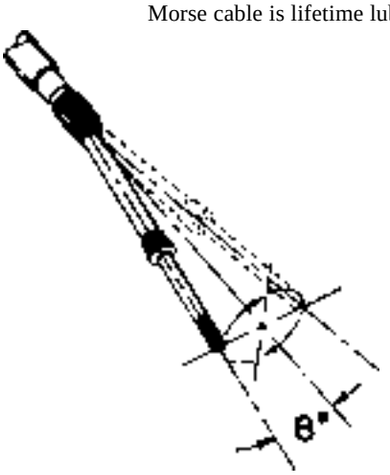
•For 33C and 33C Supreme cables

Stock #	Description
MOR32007-001	TL control
MOR63961	TL conversion kit, 30 to 40 series

MORSE CONTROLS

Shift and Throttle Control Cables
For outboards, sterndrives, inboards, jets, and auxiliary transmissions.

The control cable is a very important component in the control system, It is the vital link between the control head and the propulsion unit. Employing the best cable helps ensure that your shift and throttle system operates smoothly and efficiently. The design, technology, and materials used in Morse cables have literally set the standard for the entire marine industry. Morse Control cables are environmentally tested for marine applications, they have stainless steel rods, hubs, and end fittings as well as stainless or nylon covered core wires with moisture resistant protective seals for added corrosion protection and longer life. Their durable UV resistant polyethylene outer jackets resist abrasion and withstand the effects of salt water, chemicals, gasoline, and oil. Each Morse cable is lifetime lubricated and sealed at the factory.



Morse Controls pioneered the development of high efficiency cables. Since not all cables utilize this technology there can be significant operating differences between Morse cables and other brands.

Built in swivel compensates for arc movement of shift and throttle levers.

Protective swivel seal.

Protective wiper seal.

Ultraviolet stabilized high density poyethylene outer jacket.

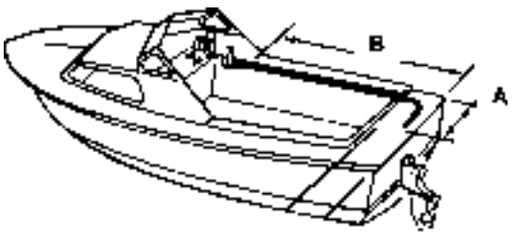
Corrosion resistant stainless steel hub.

Anti-Corrosive nickle plated brass sleeve.

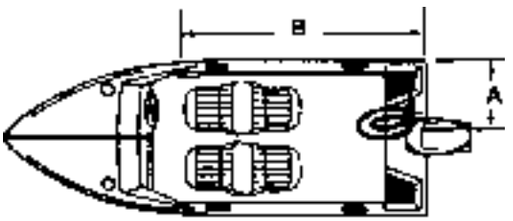
Corrosion resistant stainless steel rod.

MORSE CONTROLS

For initial installations, measure the distances A and B along an unobstructed path to the throttle and/or clutch connection. Add A and B together then round up to the nearest whole foot and that is the recommended length. Cable bends for most cables should not have less than an 8" radius. Cable bends using Supreme Cables can be as low as 4". Care should be taken to avoid unnecessary cable bends because each one adds to a cable's inefficiency.



A+B=L

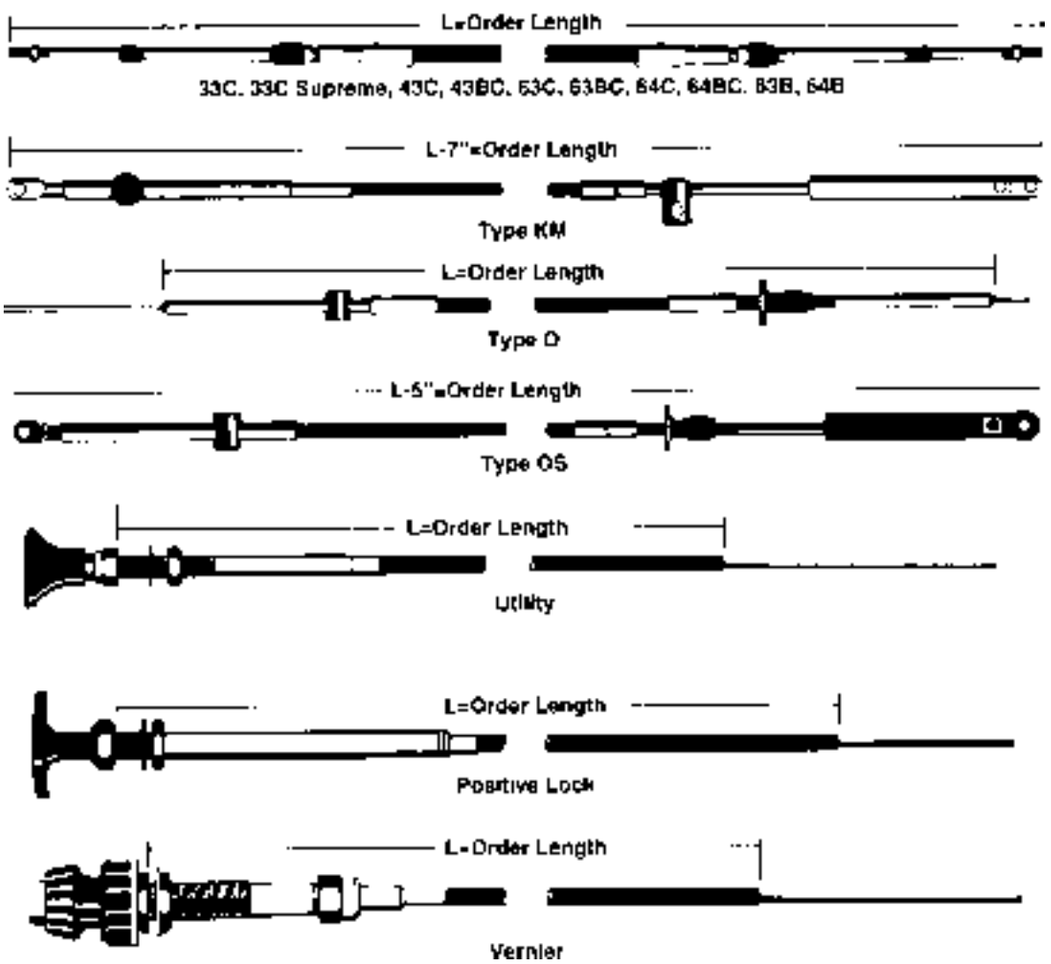


A+B+4 ft.=L

For outboard applications it is necessary to add an additional four feet for the loop that allows unrestricted engine movement.

For replacement cable installations simply remove the cable from the boat and measure the cable as indicated below. The length will be the proper replacement length.

To order, specify the length in inches and round up to the nearest whole foot. Other connection kits or hardware may be necessary. See the corresponding section in this catalog.



Original Cable P/N	Description	Morse Replacement Cable P/N	Description
MORSE			
MOR18873	Utility	MOR18873	Utility
MOR32377-003	33C	MOR32377-003	33C
MOR37912-003	63C	MOR304262-003	63CXL
MOR37912-004	64C	MOR304262-004	64CXL
MOR37913-003	63BC	MOR604263-003	63BCXL
MOR37913-004	64BC	MOR304263-004	64BCXL
MOR38012-003	43C	MOR38012-003	43C
MOR38013-003	43BC	MOR38013-003	43BC
MOR43820	Positive Lock	MOR43820	Positive Lock
MOR45336	Vernier	MOR307141-000 plus MOR307941-003	Vernier Cable/Head
MOR48296	Type O	MOR48296	Type O
MOR63732	Type KM	MOR63732	Type KM
MOR301947-003	33C Supreme	MOR301947-003	33C Supreme
MOR302029	Type OS	MOR302029	Type OS
ACCO®			
ACOOMTS	--	MOR302029	Type OS
ACOKMTS	--	MOR63732	Type KM
ACOM330L	--	MOR32377-003	33C
ACOM430C	--	MOR38012-003	43C
ACOM430CB	--	MOR38013-003	43BC
ACOM640C	--	MOR37912-004	64C
HI-LEX®			
HILCC33-30-00	--	MORCC32377-003	33C
MERCURY®			
MERC-34555A	Control Cables	MOR63732	Type KM
NW®			
NWA5119	O Style	MOR48296	Type O
NWA6523	O2 Style	MOR302029	Type OS
NWA5153	M3 Style	MOR63732	Type KM
NWA5124	WW Style	MOR32377-003	33C
NWA5797	Series 75 W-W	MOR32377-003	33C
OMC®			
OMC3773	Long-Life Cable	MOR48296	Type O
OMC3798	Long-Life Cable	MOR48296	Type O
OMC1731	Snap-In Cable	MOR302029	Type OS
TELEFLEX®			
TELCC-170	400	MOR48296	Type O
TELCC-179	600A	MOR63732	Type KM
TELCC-205	479	MOR302029	Type OS
TELCC-172	3300	MOR32377-003	33C
TELCC-199	3300LF	MOR301947-003	33C Supreme
TELCC-193	4300	MOR38012-003	43C
TELCC-192	4300	MOR38013-003	43BC
TELCC-195	6400	MOR37912-004	64C
TELCC-207	3300 UT	MOR18873	Utility
TELCC-208	3300 TL	MOR43820	Positive Lock
TELCC-206	3300 VC	MOR45336	Vernier

33C Supreme Red-Jaket Cable

The 33C Supreme employs the latest in control cable technology. The inner core is encased in nylon and travels back and forth in a high-density polyethylene liner. This plastic against plastic movement greatly decreases friction and increases efficiency by 44% over other standard push-pull cables.

•4" minimum bend radius capability versus 8" minimum bend radius for standard cables.
•Ideal for multi-station pleasure and commercial craft.
•Cable adapter kits for use with Mercury, Mercruiser, Johnson/Evinrude, and OMC sterndrive.
•3" travel 10-32 SAE threads.

Stock #	Description
MOR301947-003	33C Supreme Red-Jaket Cable

The answer to long and complex cable routings

Morse's 33C Supreme Cables are perfect for multiple station installations or other shift and throttle control applications where difficult cable routings make control applications unsatisfactory. The 33C Supreme's higher efficiency permits smaller bend radii and smoother operation than other standard cables. It's ideal for upgrading existing installations.

Features:
•100% interchangeable with 33C Red-Jacket® and other standard cables.
•Up to 45% more efficient than standard cables at 630° of bend.
•4" minimum bend radius capability versus 8" minimum bend radius for most standard cables.
•High efficiency nylon covered core for smoother operation.
•Ideal for multi-station pleasure and commercial craft.
•Can easily replace most 43C cable applications.

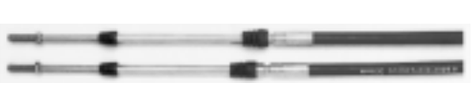
Note:
If 33C "Supreme" cables are substituted for 43C cables it will be necessary to use 30 series cable connection hardware in place of 40 series hardware. (See pages 49-54)

33C Red-Jaket®

Morse 33C Red-Jacket cables are the most widely used cable type in the world. It is an economical workhorse cable.

•Cable adapter kits available for use with Mercury, Mercruiser, Johnson/Evinrude, and OMC sterndrive.
•3" travel, 10-32 SAE threads, 8" minimum bend radius.

Stock #	Description
MORE32377-003	33C Red-Jacket Cable



MORSE CONTROLS

Type O Replacement Cable

For OMC, Evinrude, Johnson, pre 1979.

Directly replaces original cables on OMC, Evinrude and Johnson engines prior to 1979.

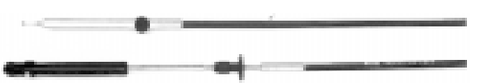
Stock #	Description
MOR48296-L	Type O Cable

Type OS Replacement Cable

For OMC, Evinrude, Johnson, 1979 to date.

Directly replaces original cables on OMC, Evinrude and Johnson engines 1979 and after.

Stock #	Description
MOR302029-L	Type OS Cable



Type KM Replacement Cable

For Mariner, Mercruiser, and Mercury.

Directly replaces original cables for Mariner, Mercruiser, and Mercury engines.

Stock #	Description
MOR63732-L	Type KM Cable

40 Series Red-Jaket Cables

For inboards, jets, and auxillary engines

The 40 Series cables are heavy duty cables recommended where heavy use or higher operating loads are encountered. 43C cables are used with inboards and jets.

- Corrosion resistant stainless steel hubs and end fittings.
- High density Red-Jaket cover is UV and abrasion resistant to last longer.
- 3" travel.
- 1/4-28 SAE threads.
- 8" minimum bend radius.

Stock #	Connection
MOR42CXL	Clamp
MOR43CXL	Clamp
MOR44CXL	Clamp
MOR42BXL	Bulkhead
MOR43BXL	Bulkhead
MOR44BXL	Bulkhead

60 Series XL Red-Jaket Cables

60 Series XL cables are extra heavy duty cables employing the latest in cable efficiency technology for the smoothest operation possible. They are ideally suited for inboards.

- Advanced cable technology for smoother operation.
- Corrosion resistant stainless steel hubs and end fittings.
- High density Red-Jaket cover is UV and abrasion resistant to last longer.
- 8" minimum bend radius.
- 5/16-24 SAE threads.
- 63C, 63BC have 3" travel.
- 64C, 64BC have 4" travel.

Stock #	Connection
MOR62CXL	Clamp
MOR63CXL	Clamp
MOR64CXL	Clamp
MOR62BXL	Bulkhead
MOR63BXL	Bulkhead
MOR64BXL	Bulkhead
MOR62BCXL	Bulkhead & Clamp
MOR63BCXL	Bulkhead & Clamp
MOR64BCXL	Bulkhead & Clamp

How to Order

See section on how to measure for original and replacement cables. Order by part number, round up to nearest whole foot, order in even foot increments. Other connection kits or hardware may be necessary, see corresponding sections.

40 Series XL Xtra Life Red Jacket Cables

A new high efficiency cable that has a nylon covered core, polyethylene cable liner, plus the added feature of Self Adjusting Seals (SAS) to keep moisture and other foreign matter out of the cable. Cable life and performance are greatly enhanced when XL Morse cables and other manufacturers comparable cables.

Stock #	Description
MOR42BXL	3 feet plus
MOR43BXL	
MOR44BXL	
MOR42CXL	3 feet plus
MOR43CXL	
MOR44CXL	
MOR42BCXL	3 feet plus
MOR43BCXL	
MOR44BCXL	

60 Series Q.B.C. Components

To build 60 series XL xtra Life Cables

Stock #	Description
MOR304561-002	62B Bulkhead Kit
MOR304561-003	63B Bulkhead Kit
MOR304561-004	64B Bulkhead Kit
MOR304562-002	62C Clamp Kit
MOR304562-003	63C Clamp Kit
MOR304562-004	64C Clamp Kit

MOR304560 ..... Cable - 3 feet thru 30 feet

Cables over 20 ft. are special order.

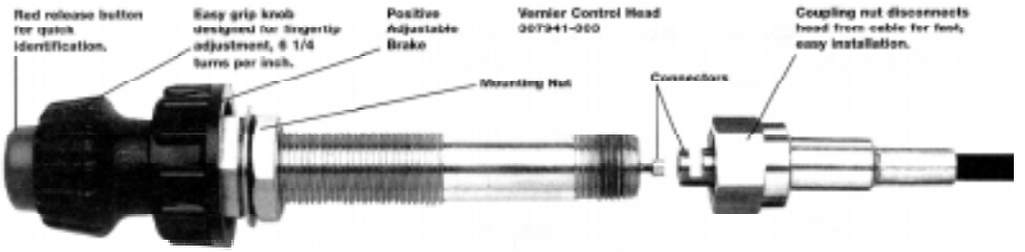
33 Series Positive Locks

Stock #	Description
MOR33LPL-05	5 feet
MOR33LPL-10	10 feet
MOR33LPL-15	15 feet
MOR33LPL-20	20 feet
MOR33LPL-25	25 feet
MOR33LPL-30	30 feet
MOR33LPL-35	35 feet
MOR33LPL-40	40 feet
MOR33LPL-45	45 feet
MOR33LPL-50	50 feet

33 Series Positive Locks

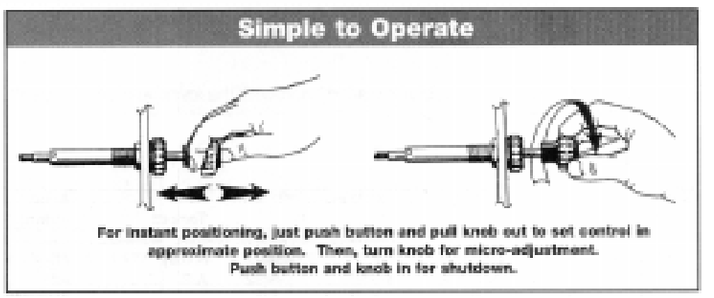
Stock #	Description
MOR37693	30L Stop Collar
MOR43133-001	T-Handle--Black Plastic
MOR43229	30L Clamp
MOR47639	30L Pivot
MOR47640	30L Pivot
MOR47641	30L Pivot
MOR63676	T-Handle--Aluminum
MOR300673	30L Bulkhead Adapter Kit
MOR302485	30L Clamp Adapter Kit
MOR304307	30C Clamp to Bulkhead Kit
MOR304308	40C Clamp to Bulkhead Kit
MOR304309	60C Clamp to Bulkhead Kit

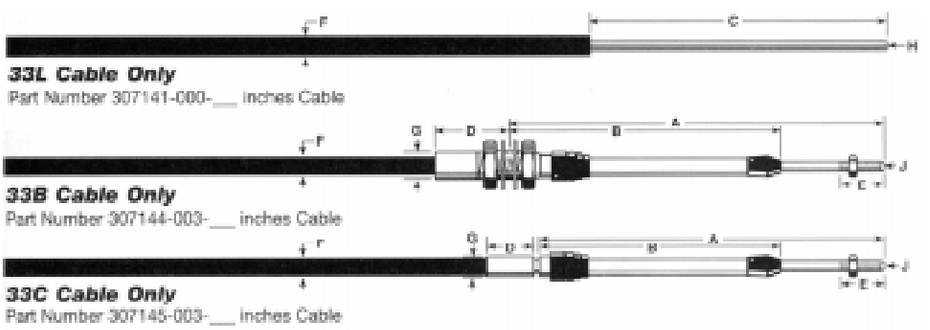
A Quick-Release Control With Detachable Cable For Fast and Simple Installation


Red release button for quick identification.
Easy grip knob designed for fingertip adjustment, 6 1/4 turns per inch.
Positive Adjustable Brake
Vernier Control Head 307941-000
Coupling nut disconnects head from cable for fast, easy installation.
Mounting Nut
Connectors

The Ultimate Control Cable for Setting Engine RPM and Other Micro/Macro Adjustments.

When exact engine RPM settings are desired, the Morse Quick Release Vernier Control is ideal. Applications range from generator sets, to manual throttles for warm up on a wide variety of on and off-road vehicles.


Simple to Operate
For instant positioning, just push button and pull knob out to set control in approximate position. Then, turn knob for micro-adjustment.
Push button and knob in for shutdown.


33L Cable Only
Part Number 307141-000-___ inches Cable
33B Cable Only
Part Number 307144-003-___ inches Cable
33C Cable Only
Part Number 307145-003-___ inches Cable

Fast and Simple Installation.
The vernier control head is easily disconnected from the cable by simply backing off the coupling nut and disengaging the connectors. This feature eliminates pushing cables through mounting cutouts and trying to route from the cab end. The control head can be mounted independently to the dash and then connected to the cable on the other side of the dash or firewall.

Positive Adjustment.
Depress the red release button and pull the Vernier knob out until an approximate rpm setting is achieved. Fine tuning the setting is accomplished by turning the knob in either direction. 6.25 turns for 1" of travel provides for expanded micro adjustment.

Positive Adjustable Brake.
Precise settings can be maintained through vibration or governor back pressure by setting the right amount of friction on the brake. Only 3/4 of a turn are required from hold to release positions.

Fast Shutdown.
The red release button makes for quick identification when fast shutdown is required. Simply depress the red button and simultaneously push in the knob for immediate shutdown.

Operating Loads.
The vernier control is recommended for operating loads up to 20 lbs. regardless of the series cable selected. The control can withstand much higher operating loads, but human engineering factors come into play at about 20 lbs. Operating finger-tip type controls at loads above 20 lbs. can cause fatigue and discomfort to operator's fingers and hands. COnsideration should be given to a different type of control for loads exceeding 20 lbs.

Cable Travel.
The Quick Release Vernier features a standard 3" of travel. Travel under 3" can be accommodated using an L type cable and a stop collar or pivot on the core wire to restrict travel. Reduced travel with 33 or 43 series cables with rod type output ends can be accommodated with stops on the lever mechanism to which the cable is attached.

Positive Lock

Vernier

Utility

Bulkhead Adapter

Clamp Adapter

Specialty Control Cables

Utility Cables

An easy-to-install, easy to operate flexible cable for remote control of choke, throttle, shut off, fuel valves, vents, and many other applications. Solid stainless steel core wire resists corrosion, moves easily in non-metallic liner, even after months of storage. Furnished complete with conduit clamp and stop nut.

Vernier Cables

Just push the button for fast easy setting of approximate position, then turn the knob for mirco adjustment. Positive, adjustable brake maintains settings regardless of vibration or governor back pressure. Ideal for throttles or other applications where precise control is desired. Uses standard Morse throttle connection kits.

Positive Lock Cables

Just a twist of the "T" handle locks cable in any setting. It is the ideal control when seperate throttle control is required for engine warm-up or for operating auxiliary equipment. Solid stainless steel core wire resists corrosion, moves easily in non-metallic liner.

Hub Adapter Kits

These kits are used in the field to adapt utility, neutral throttle, and vernier cables to mount in bulkhead or clamp applications.

How to Order

Specialty cables are available only in 5 foot increments, starting at 5 ft. These solid wire plain end cables can be shortened to the exact length required. Order by part number and specify length.

Stock #	Description
MOR18872	Utility cable with knob
MOR18873	Utility cable with T-Handle
MOR43820	Positive lock cable
MOR300673	Bulkhead adapter kit
MOR302485	Clamp adapter kit

The vernier cable requires ordering two part numbers.

MOR307141-000-L	Vernier cable
MOR307941-003	Vernier cable head

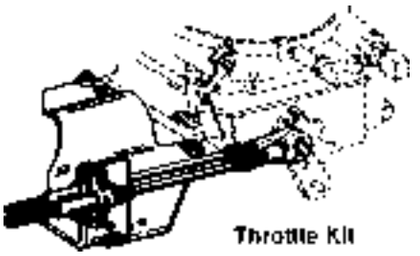
Pre-Engineered Clutch Connection Kits

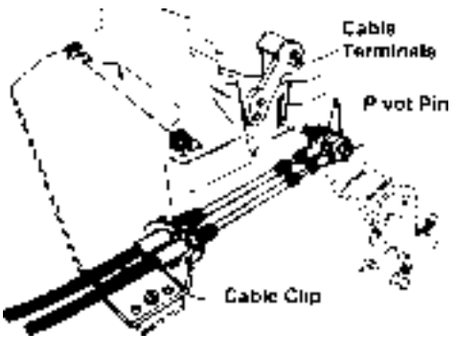
Dual Station 33C Cable	Dual Station 43C Cable	Convert from 33C Dual Stn. to 43C Dual Cables	Transmission Make	Transmission Model
MOR41482	MOR41483	N/A	Allison	M & MH
MOR304474	MOR301474	MOR300665	Borg Warner	70, 71, & 72 in. line with red gear, rear entry 71C & 72C drop center front entry
MOR35627	MOR35627	MOR300665		
MOR36680	MOR36680	MOR40773	Capital	*12400
MOR36680	MOR36680	MOR40773		*2, 3, & 4 HD & HE
MOR36680	MOR36680	MOR40773	Paragon	*HF-7
			Twin Disc	MG, 508, 509, 510, 510A, 512, 514C, 514CHP, 518
MOR42577	N/A	MOR30665		521, 527, 530, $ 540
MOR63696	N/A	MOR300665		MG502, 506, & 507
				Twin Disc Trolling Valve Kit
MOR307171	N/A	N/A		MG509, 510A, 511A, & 514C (uses 33VC vernier cable)

Note: In applications where single station kit is not given, dual station kits can be used.

*P/N MOR36680 and MOR40773 are all-purpose clutch and throttle kits. These kits include all pivots, ball joints and other special hardware required to assemble a clutch or throttle kit. They DO NOT include the main mounting bracket. This must be fabricated locally.

MORSE CONTROLS





Throttle and Clutch Connection Kits

While most engines are supplied with cable connection mounts and hardware, some require additional hardware.

Three types of throttle and clutch connection kits are offered to complete your control system: pre-engineered bolt-on kits, cable adapter kits and all purpose universal clutch and throttle kits.

These kits are pre-engineered for specific engines or reverse gears and contain all necessary parts for attaching your Morse cables to the clutch or throttle.

All Purpose Universal Clutch and Throttle Kits

The universal clutch and throttle kits include all of the pivots, ball joints, and other special hardware needed to fabricate a clutch or throttle kit. They do not include the main mounting bracket (shown in dotted lines).

Morse Control and Throttle Kit Selection Guide

Pre-Engineered Throttle Connection Kits

Single Station 33C Cable	Dual Station 33C Cable	Convert from 33C Dual Stn. to 43C Dual Stn. add:	Engine Make	Engine Model
MOR305403	MOR305403	N/A	Caterpillar	3208TA
MOR300172	MOR300172	MOR300665		3208NA
MOR36680	MOR36680	MOR40773		*334, 3304, &3306
MOR36680	MOR36680	MOR40773		*3406, 343
MOR36680	MOR36680	MOR40773		*3408
MOR36680	MOR36680	MOR40773	Cummins	*A11 w/MVSGOV
MOR300580	MOR300580	MOR300665		AFC Fuel Pump V504M, V55m, V903M, VT903M VTA903M, NT855M VT1710M, VTA1710M KT & KTA 1150M KT & KTA 2300M 1975 and later
MOR41736	MOR41736	MOR300665	General Motors	3, 4, 6-71 w/var. sp. gov.
MOR41736	MOR41736	MOR300665		6, 8, 12 V-71
MOR41736	MOR41736	MOR300665		6, 8 V92 (NA & TA) w/var. sp. gov.
MOR36680	MOR36680	MOR40773		*2, 3, 4-53 w/left and right hand gov.
MOR36680	MOR36680	MOR40773		*GV-53 rear and front entry
MOR36680	MOR36680	MOR40773		*6 & 8V-71 front entry shut-down kit (use w/DC control
MOR35360	N/A	N/A		6-71 (shut-down)
MOR41295	N/A	N/A		12V-71 (shut-down)
MOR48931	MOR48931	MOR300665	Perkins	4,236M
MOR302026	MOR302026	N/A		354-4M
MOR303878	N/A	N/A		4,108 w/shut off
MOR304105	MOR304105	N/A		4,154M
MOR36680	MOR36680	MOR40773	Universal	*Atomic 4
MOR36680	MOR36680	MOR40773		*Atomic 1 & 2 clutch & throttle (63C clutch-33C throttle)

MOR300557

Connection Kits and Adapters

The final component of a control system is the connection point of the cable to the engine and the control. Morse manufactures a complete line of kits complete with all the necessary hardware to easily finish the installation.

MOR301729

MOR301901

MOR302123

Cable Adapter Kits

These kits are used to adapt 33C and 33C Supreme cables to fit directly into the existing engine connections.

Stock #	Description
MOR300557	Adapts 33C or 33C Supreme for use with OMC Sterndrive
MOR301729	Adapts 33C or 33C Supreme for use with Evinrude/Johnson 55-235 h.p. 1978 to date, 20 h.p. and up in 1986, 20-25-30 h.p. motors may need OMC Kit 397488 if motor does not have it installed.
MOR301901	Adapts 33C or 33C Supreme for use with Mercury Outboards 40-300 h.p.
MOR302123	Adapts 33C or 33C Supreme for use with mercruiser.
MOR300465	U.S. Mariner (Force) 1975 & later. Kit not pictured.
MOR35640	Evinrude/Johnson 25 thru 40 h.p. up thru 1985. Kit not pictured.
MOR301543	Evinrude/Johnson 9.9 & 15 h.p. 1974 and later. OMC Kit also required. Kit not pictured.

MOR301074

Note:

For Mercury Outboards 6, 8, and 9.9 h.p., use Morse P/N 301901 and Mercury P/N 42805A1 (1986 and later).

For Mariner Outboards 6, 8, and 9.9 h.p., use Morse P/N 301901 and Mercury P/N 42805A4 (U. S. Origin).

For Mercury Outboards 18, 20, and 25 h.p., use Morse P/N 301901 and Mercury P/N 95722A1 (1983 and earlier).

For Mercury Outboards 18, 20, and 25 h.p. (1984 and later) use Morse P/N 301901 and Mercury P/N 95722A3.

MOR304939

Control Adapter Kits

These kits adapt 33C and 33C Supreme cables for use with other controls.

Stock #	Description
MOR301074	Adapts 33C and 33C Supreme for use with Mercury/Mariner Controls.
MOR304939	Adapts 33C and 33C Supreme for use with 1979 and later OMC Controls.

Pivots

30 Series

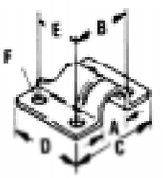
Stock #	A Dim.	B Dim.	C Dim.	D Dim.	E Dim.
MOR31029	1/4"	7/16"	21/64"	9/64"	5/8"
MOR31539	1/4"	7/16"	3/8"	.191	23/32"
MOR32392	1/4"	7/16"	21/64"	.295	25/32"
MOR37691	5/16"	7/16"	3/8"	13/32"	1-1/16"
MOR39471	5/16"	7/16"	3/8"	7/16"	1"
MOR39890	1/4"	7/16"	3/8"	.316	15/16"
MOR43939	1/4"	1/2"	3/8"	.376	15/16"
MOR45583	3/16"	7/16"	3/8"	9/64"	11/16"
MOR44770	7/16"	5/8"	3/8"	13/64"	3/4"

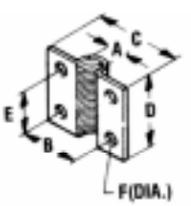
40 Series

Stock #	A Dim.	B Dim.	C Dim.	D Dim.	E Dim.
MOR31537	1/4"	1/2"	1/2"	13/64"	7/8"
MOR36361	1/4"	1/2"	1/2"	17/64"	15/16"
MOR39110	1/4"	1/2"	7/16"	9/64"	3/4"
MOR39804	1/4"	1/2"	1/2"	19/64"	15/16"
MOR42419	3/8"	9/16"	1/2"	25/64"	13/15"
MOR43314	1/4"	1/2"	3/8"	9/64"	11/16"
MOR45199	5/16"	1/2"	9/16"	9/64"	29/32"

60 Series

Stock #	A Dim.	B Dim.	C Dim.	D Dim.	E Dim.
MOR43195	3/8"	5/8"	37/64"	.463	1-17/64"
MOR44643	5/16"	5/8"	37/64"	.182	1"
MOR40889	1/2"	3/4"	5/8"	33/64"	1-3/8"





Cable Clamp

20 Series (No Hub)

Stock #	A Dim.	B Dim.	C Dim.	D Dim.	E Dim.
MOR45202	7/32"	3/4"	1-1/4"	1/2"	7/32"

30L Series (No hub)

Stock #	A Dim.	B Dim.	C Dim.	D Dim.	E Dim.
MOR43229	1/4"	1"	1-1/2"	1/2"	7/32"

30L Series (No Hub)

Stock #	A Dim.	B Dim.	C Dim.	D Dim.	E Dim.
MOR37664	1/4"	1"	1-1/2"	1-1/4"	3/4"

30L and 30 Series

Stock #	A Dim.	B Dim.	C Dim.	D Dim.	E Dim.
***MOR31509**	3/8"	1"	1-1/2"	1/2"	12/64"

40 Series

Stock #	A Dim.	B Dim.	C Dim.	D Dim.	E Dim.
***MOR31532**	1/2"	1"	1-1/2"	1/2"	7/32"

60 Series

Stock #	A Dim.	B Dim.	C Dim.	D Dim.	E Dim.
***MOR36733**	9/16"	1-1/4"	1-3/4"	5/8"	9/32"

40 Series

Stock #	A Dim.	B Dim.	C Dim.	D Dim	E Dim.
MOR21227	1/2"	1"	1-1/2"	1-1/4"	3/4"

* Most commonly used.

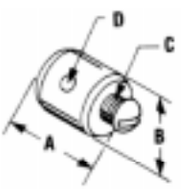
NEW!

Cable Mounting/Anti-Vibration Kits

- Reduces noise and vibration
- Reduces Cable Cost

(Because you can use a 33C instead of a 33B Bulkhead mount)

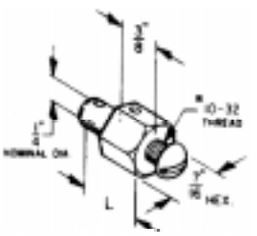
Stock #	Description
MOR294200	30 Series C-Mounting/Isolator Kit
MOR294201	40 Series C-Mounting/Isolator Kit



Stop Collar for Bare Wire

30 Series Only

Stock #	A Dim.	B Dim.	C Dim.	D Dim.
MOR37693	3/8"	3/8"	8-32"	3/32"



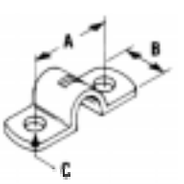
Pivots for Bare Wire

20 & 30L Series

Stock #	Lever Thickness	"L" Dimension
MOR47639	1/8"	21/32"
MOR47640	3/16"	3/4"
MOR47641	1/4"	13/16"

Adapters

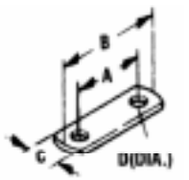
Stock #	Description
MOR300673	Bulkhead adapter kit
MOR302485	Clamp adapter kit



Cable Clamp for MT-3

30 Series Only

Stock #	A Dim.	B Dim.	C Dim.
MOR32010	7/8"	1/2"	3/16"

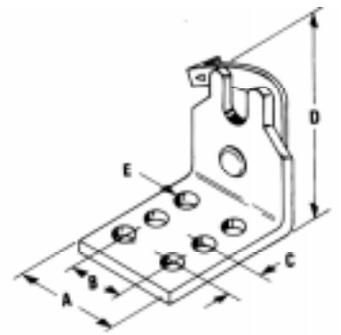


Shims

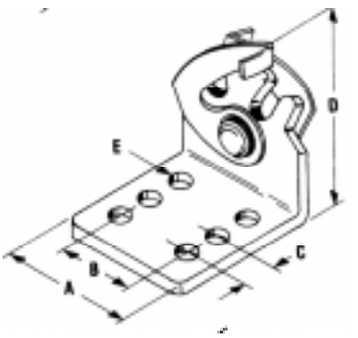
Stock #	A Dim.	B Dim.	C Dim.	D Dim
MOR35777	7/8"	1-3/8"	1/2"	12/64"
MOR31538	1"	1-1/2"	1/2"	12/64"
MOR37884	1-1/4"	1-3/4"	5/8"	9/32"

Single

Stock #	A Dim.	B Dim.	C Dim.	D Dim.	E Dim
MOR36174	1"	1/2"	3/8"	1-1/2"	13/64"



Cable Hook Clip



Double

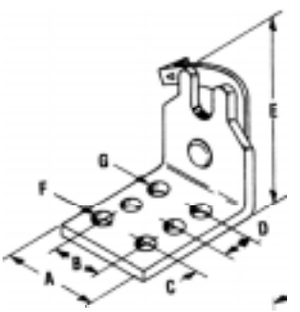
Stock #	A Dim.	B Dim.	C Dim.	D Dim.	E Dim.
MOR35531	1-1/4"	3/4"	3/8"	1-1/2"	13/64"

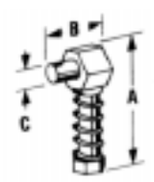
Cable Clip OMC

30 Series Only

Stock #	A Dim.	B Dim.	C Dim.	D Dim.	E Dim.	F Dim.	G Dim.
MOR31419	1"	1/2"	3/8"	1/2"	1-3/15"	1/4"	3/16"

Stock #	Description
MOR31435	For OMC Outboard

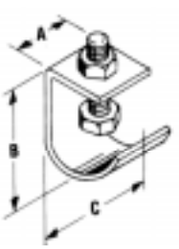




Spring Link Terminal

30 Series Only

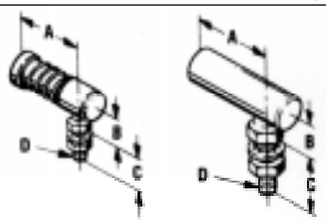
Stock #	A Dim.	B Dim.	C Dim.
MOR31545	1-1/4"	21/32"	1/4"



Cable Break

30, 40, and 60 Series
(applied at control end of cable)

Stock #	A Dim.	B Dim.	C Dim.
MOR44386	3/4"	1-1/4"	7/8"



Ball Joints

30 Series

Stock #	A Dim.	B Dim.	C Dim.	D Dim.	Type
MOR31126	31/32"	15/32"	9/16"	1/4-28"	QR
MOR31799-001	29/32"	15/32"	7/16"	10-32"	QR
MOR35242	1-1/8"	17/32"	7/8"	5/16-24"	QR

40 Series

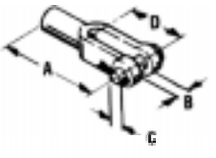
Stock #	A Dim.	B Dim.	C Dim.	D Dim.	Type
MOR29104	31/32"	15/32"	9/16"	1/4-28"	QR
MOR32267	31/32"	17/32"	7/8"	5/16-24"	QR

60 Series

Stock #	A Dim.	B Dim.	C Dim.	D Dim.	Type
MOR29108	1-1/8"	17/32"	7/8"	5/16-24"	QR
MOR38491	1-1/8"	17/32"	11/16"	5/16-24"	ST

80 Series

MOR36637 ..... 1-3/8" ..... 7/8" ..... 3/8"-24



Clevis

30 Series

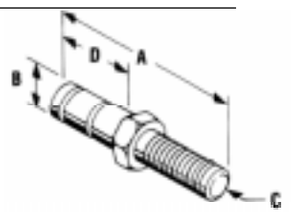
Stock #	A Dim.	B Dim.	C Dim.	D Dim.
MOR31125	2"	9/32"	1/4"	1-1/4"
MOR31800	1-9/16"	3/16"	3/16"	1"
MOR33395	2-1/4"	11/32"	5/16"	1-7/16"

40 Series

Stock #	A Dim.	B Dim.	C Dim.	D Dim.
MOR29025	2"	9/32"	1/4"	1-1/4"
MOR42212	2-1/4"	11/32"	5/16"	1-7/16"
MOR45985	2-1/2"	7/16"	5/8"	1-5/8"

60 Series

Stock #	A Dim.	B DIm.	C Dim.	D Dim.
MOR29132-001	2-1/4"	11/32"	5/16"	1-7/16"
MOR38820	2-7/8"	1/2"	7/16"	1-7/8"
MOR42034	2-1/2"	7/16"	3/8"	1-5/8"
MOR45507	3"	9/16"	1/2"	1-7/8"



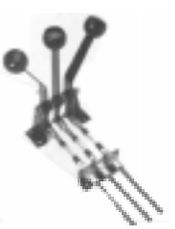
Terminal Eye Pin

30 or 40 Series

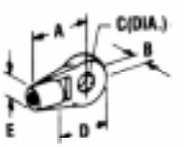
Stock #	A DIm.	B Dim.	C Dim.	D Dim.
MOR300965 (Holds 2 eyes)	1-1/2"	5/16"	1/4-28"	19/32"
MOR47383 (Holds 3 eyes)	1-11/16"	5/16"	1/4-28"	7/8"

MOR301456 ..... Terminal Pin Kit contains 3000965, retaining ring, nut and washer. (Holds 2 eyes)

MLK Controls



•Create your own 1 to 5 lever control systems
•Assemble it yoursaelf
•90°, 30°, 15° levers easily stack together
•Kits come complete with all necessary mounting hardware
•Uses 40 and 60 Red Jacket® cables B or BC with 2 or 3 inch travel.
For More information, request a Morse Industrial Products Catalog from Seattle Marine. - 800-426-2783.



Terminal Eye

30 Series Only

Stock #	A Dim.	B Dim.	C Dim.	D Dim.	E Dim.
MOR31980	1"	15/64"	5/16"	3/4"	1/2"
MOR300646	1"	15/64"	5/16"	3/4"	1/2"

40 Series Only

Stock #	A Dim.	B Dim.	C DIm.	D Dim.	E Dim.
MOR41134	1-3/8"	5/16"	5/16"	3/4"	1/2"
MOR37639	1"	15/64"	5/16"	3/4"	1/2"

60 Series Only

Stock #	A DIm.	B DIm.	C Dim.	D DIm.	E Dim.
MOR41316	1-1/2"	3/8"	1/2"	1-1/16"	11/16"
MOR46032	1-1/2"	3/8"	3/8"	1"	9/16"
MOR45428	1-3/8"	5/16"	5/16"	3/4"	1/2"

MC Control

The MC is a shift-only control used primarily on sailboats. A very attractive control, the MC is made from chrome plated bronze to resist corrosion.

Stock #	Description
MOR39786-001	MC Control

Accessories and Parts for MJB and MC Controls

Stock #	Description
MOR35232-004	Ball Knob--Black
MOR35232-005	Ball Knob--White
MOR44386	Cable Brake--Throttle
MOR47346	Neutral Safety Switch

SM Control

The SM Control is a side or panel mounted control used for shift. Made from heavily chrome plated bronze, it is rugged and durable. Can also be used for parallel or series dual station installations.

Stock #	Description
MOR29669	SM Control

Accessories and Parts

Stock #	Description
MOR29674-001	Hand & Lever
MOR35232-004	Ball Knob--Black
MOR61026	Hardware Bag

MA Assembly Guide Components

Stock #	Description
MOR300141	MA Base Control
MOR300125	40 Series Cable Connection Kit
MOR300126	60 Series Cable Connection Kit
MOR300457	MT30, 40 and 70 Series Cable Kit
MOR300135	Neutral Safety & Reverse Switch--Black
MOR300136	Neutral Safety & Reverse Switch--Red
MOR300129	Switch Installation Kit
MOR43292	Gate Plate
MOR61876	Gate Plate
MOR61877	Gate Plate
MOR62960	Gate Plate
MOR63312	Gate Plate
MOR64986	Gate Plate
MOR64987	Gate Plate
MOR44426-001	Position Strip
MOR44426-002	Position Strip
MOR61126-001	Position Strip

MA Base Control

Cable Kit

Switch

Switch Installation Kit

MOR61126-002	Position Strip
MOR65685-001	Position Strip
MOR65685-002	Position Strip
MOR65686-001	Position Strip
MOR65686-002	Position Strip
MOR65687-001	Position Strip
MOR65687-002	Position Strip
MOR66697-001	Position Strip
MOR66697-002	Position Strip
MOR68410-001	Position Strip
MOR68410-002	Position Strip

Valve Connection Kits

Stock #	Description
MOR303033	Cessna 33700
MOR303418	Commercial Intertech A-20
MOR303412	Commercial Intertech A-35
MOR305379	Commercial Intertech VM40
MOR303416	Commercial Intertech 505, 506, 507, VM31, 32, 33
MOR305309	Commercial Intertech 505, 506, 507 Rear Entry
MOR307489	Commercial Intertech VA20
MOR303036	Cross 3LR -- 3CV
MOR302890	Cross BA, BC, CA, CD
MOR303032	Energy CVSD, CVP, CVA-2
MOR302863	Gresen SP, SPK, SSK -- Clevis kit
MOR303032	Gresen 2SP, CP, CS, V20, V42
MOR306769	HUSCO 5000
MOR303031	HUSCO 6000
MOR302889	Parker VDP-12
MOR306962	Prince 5100, 5200, 5300
MOR306963	Prince SVW
MOR306779	Racine 3/8
MOR303031	Racine 15 (3/8)
MOR302889	Racine ML25 (1/2)
MOR304195	Racine SV-25
MOR303034	Rex Roth 30-S2, MP-18
MOR306771	Rex Roth SM-12
MOR305418	Rockford 4-716-000-28312
MOR45985	Vickers CM 11-Clevis Kit
MOR304195	Webster SV-25
MOR302863	Gresen
MOR302889	Parker VDP-12, Racine ML25 (1/2)
MOR302890	Cross BA, BC, CA, CD
MOR303031	Racine ML15 (3/8), HUSCO 6000

206301 207780

Remote Valve Controls

The Single and Dual Axis Remote Valve Controls are the perfect way to operate high pressure hydraulic valves, like directional control spool valves.

Stock #	Description
MOR206301	RVC Single Axis 9.8 in Lever
MOR308721	RVC Dual Axis + Mode 9.8 in Lever
MOR206370	RVC Single Axis 11.8 in Lever
MOR207780	RVC Single Axis with Center locking lever 9.8 in lever.

MOR303032	Gresen 2SP, CP, CS, V20, V42, Energy CVSD, CVP, CVA-2
MOR303033	Cessna 33700
MOR303034	Rex Roth 30-52
MOR303036	Cross 3LR--3CV
MOR303412	Commercial Shearing A-35
MOR303412	Commercial Shearing 505, 506, 507, VM31, 32, 33
MOR303418	Commercial Shearing A-20
MOR304195	Webster SV-25
MOR305309	Commercial Shearing 505, 506, 507, (Rear Entry)
MOR305379	Commercial Shearing VM40
MOR305418	Rockford 4-716-000-28312

MAXX Assembly Guide Components

Stock #	Description
MOR302015	MAXX Base Control
MOR302011	40 and 60 Series Hardware Kit
MOR302007	Neutral Park or Reverse Switch
MOR301195	Quadrant Plate--Allison
MOR301196	Quadrant Plate--Allison
MOR301197	Quadrant Plate--Allison
MOR301738	Quadrant Plate--Allison
MOR305530	Quadrant Plate--Ford C6
MOR305955	Quadrant Plate--Turbo 400
MOR300986-001	Position Strip--Allison
MOR300986-002	Position Strip--Allison
MOR300988-001	Position Strip--Allison
MOR300988-002	Position Strip--Allison
MOR300989-001	Position Strip--Allison
MOR300989-002	Position Strip--Allison
MOR300990-001	Position Strip--Allison
MOR300990-002	Position Strip--Allison
MOR300991-001	Position Strip--Allison
MOR300991-002	Position Strip--Allison
MOR301740-001	Position Strip--Allison
MOR301740-002	Position Strip--Allison
MOR305954-001	Position Strip-Turbo 400
MOR305954-002	Position Strip-Turbo 400
MOR305998-001	Position Strip--Ford C6
MOR305998-002	Position Strip--Ford C6

MAXX Base Unit

Hardware Kit

Quadrant

Switch Kit

Accelerator Pedal Systems

An Accelerator pedal system to satisfy virtually any foot throttle application.

The API has an idler feature that allows operators to maintain
a set speed without having to hold their foot on the pedal..

A Vernier is used with the API and APD to hold the desired operating speed and can be quickly shut down to return to idle.

An added feature of the APD is the ease of reducing the set operating speed by stepping down on the pedal extension. To return to the operating speed, the pedal is pressed past the set position and released.

Note: API and APD are not recommended for over the road vehicles.

Stock #	Description
MOR208994	APS - Standard
MOR208995	API - With Idler
MOR305337	APD - Accelerator/Decelerator

Accessories

Stock #	Description
MOR208458	Heel Support for APS & API
MOR208459	Side Guard for APS & API
MOR301045	Underfloor Boot for APS & API

PTO Power Take-Off Cables

This new PTO cable has been designed to be 100% interchangeable with DANA® PTO cables and other manufacturers' PTO cables as well.

The solid knob withstands rugged use, and the tough polyethylene outher jacket provides protection from weather, splash and spray.

Stock #	Feet	Inches
MOR305492	5	60
	10	120
	15	180
	20	240
	25	300
	30	360

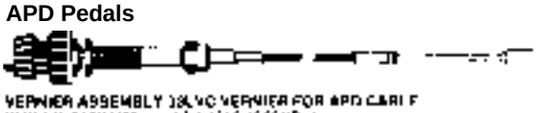
Black Knob

Accessories

Stock #	Description
MOR62267	HUB Kit
MOR302001	PTO Conduit Kit
MOR304703	Black Knob
MOR305481	Red Knob
MOR305487	PTO Decal
MOR305488	Dump Decal
MOR305674	Pump Decal

Conduit Kit

For APD Pedals

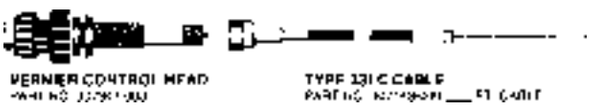


Stock #	Description
MOR307977	Vernier Assembly 33LVC Vernier for APD Cable

Note: Cables over 15 ft. are special order.

MORSE CONTROLS

For API Pedals--Must order both control head and cable.



Stock #	Description
MOR307941-003	Vernier Control Head
MOR307143	Type 33LC Cable

Standard Valve Controls

Stock #	Description
MOR47975	63 Series Valve Control
MOR48008	42 Series Valve Control
MOR60018	62 Series Valve Control
MOR67424	43 Series Valve Control

Service Parts

Stock #	Description
MOR29106	Ball Knob--Black

MX & MXC Controls

These rugged steel controls are used primarily on transit mixers but can easily be used on other types of off-road vehicles to operate a throttle, clutch, pump or valve control as required.

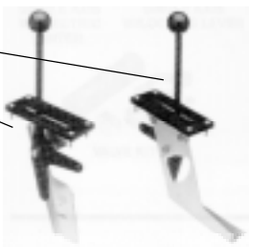
Stock #	Description
MOR300409	MX Control, two levers
MOR300417	MXC Control, one lever

Accessories

Stock #	Description
MOR300413	Hanger Bracket Kit
MOR300437	Hanger Bracket Kit Note: MOR300413 and MOR30047 Required for use with MOR300409 MX Con trol. MOR300437 ONLY Re quired for use with MOR300417 MXC Control.

Service Parts

Stock #	Description
MOR35232-001	Knob-Red
MOR35232-002	Knob-Green Use 30 Supreme, 40 XL or 60 XL Series Cables.



MG Controls

MG Controls are flush mount controls that are simple to install. They provide a clean, attractive appearance and can be used for valve, throttle, and PTO types of applications.

Stock #	Description
MOR300583	MG Control -- Vertical -- non-gated
MOR300584	MG Control -- Horizontal -- non-gated

Gate Plates -- 3 Inch Travel

Stock #	Description
MOR300588-001	Straight Gate
MOR300588-002	Center Detent
MOR300588-003	Two Detents
MOR300588-004	Three Detents

Gate Plates -- 2 Inch Travel

Stock #	Description
MOR300588-005	Straight Gate
MOR300588-006	Center Detent
MOR300588-007	Two Detents
MOR300588-008	Three Detents

MU controls

For Dump and PTO. This gate, 2 Lever RVC-Remote Valve Control easily operates hydraulic valves and power take-offs.

Stock #	Description
MOR63896	MU--2 Lever--60 Series
MOR300398	MU--2 Lever--40 Series

Accessories

Stock #	Description
MOR66808	Floor Stand--2 Lever
MOR303898	Surface Mounting Kit

Service Parts

Stock #	Description
MOR65213	Ball Knob--Yellow
MOR65214	Ball Knob--Red
MOR67175-002	Position Strip (Out-In)
MOR67581	Gate Plate
MOR67586-001	Position Strip (Down-Hold-Up)
MOR67586-002	Position Strip (Up-Hold-Down)

MU Controls

For Funk Powershift Transmissions--1000-1500-1700 Series

Stock #	Description
MOR300290	MU--2 Lever--3 Speed and Direction
MOR300291	MU--1 Lever--Feathering or Inching
MOR300297	MU--2 Lever--4 Speed and Direction

Accessories

Stock #	Description
MOR66805	Floor Stand--1 Lever
MOR66808	Floor Stand--2 Lever
MOR303897	Surface Mounting Kit--1 Lever
MOR303898	Surface Mounting Kit--2 Lever

Connection Kits

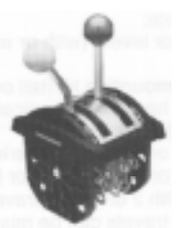
Stock #	Description
MOR300288	For 300290 and 300297

Service Parts

Stock #	Description
MOR29106	Ball Knob--Black

MORSE CONTROLS

MU



Stand

MU Universal Controls

A wide range of readily available MU Controls provide the features, functions and performance requirements to satisfy most application needs.

Stock #	Description
MOR66486-002	1 Lever with Ratchet Brake
MOR66491-002	2 Lever with Straight Gate
MOR66493-002	1 Lever with Straight Gate
MOR66494-002	3 Lever with Straight Gate
MOR66495-002	1 Lever with Z Gate
MOR66498-002	1 Lever with Friction Brake

MOR66486

MU Controls

For Clark Powershift Transmissions

This gated, 2 Lever RVC-Remote Valve Control easily operates hydraulic valves and power take-offs

Stock #	Description
MOR65707-002	MU 2 Lever-- 18300 and 28300 Double spool valve without neutral on speed range
MOR65707-004	MU 2 Lever--18300 and 28300 Double spool valve with neutral on speed range
MOR65713-002	MU 2 Lever--18400 and 28400 Double spool valve without neutral on speed range
MOR65713-004	MU 2 Lever--18400 and 28400 Double spool valve with neutral on speed range

MOR66491

MOR66493

MU Controls

For Eaton Heavy Duty Hydrostatic Transmissions (PV-MG)

Stock #	Description
MOR300294	MU -- 1 Lever with Friction Brake
MOR300305	MU -- 1 Lever with Friction Brake and Z Gate
MOR300306	MU -- 1 Lever with Ratchet Brake

MOR66498

MOR66494

Accessories

Stock #	Description
MOR66344	Neutral Start Switch
MOR66805	1 Lever Floor Stand
MOR66808	2 Lever Floor Stand
MOR67483	3 Lever Floor Stand
MOR303897	1 Lever Surface Mounting Kit
MOR303898	2 Lever Surface Mounting Kit
MOR303899	3 Lever Surface Mounting Kit
MOR48454	Terminal, 60 Series
MOR60605	Terminal, 40 Series
MOR61006	Spring for MU hardware
MOR62751	Rack Segments for ratchet
MOR62771	Brake Shoe for friction
MOR62734	Rack strips for ratchet

Connection Kits

Stock #	Description
MOR65669	28000 -- Double Spool -- Top Entry
MOR65671	28000 -- Double Spool -- Horizontal Entry
MOR65674	18000 & 28000 -- Single Spool -- Horizontal Entry
MOR65675	28000 -- High/Low Range
MOR300999	28000 -- Double Spool -- Bottom Entry
MOR301999	18000 -- Double Spool -- Bottom Entry
MOR304851	18000 -- Double Spool -- Horizontal Entry
MOR300292	Rear Entry Kit -- 43C
MOR300293	Front Entry Kit -- 43C

Service Parts

Stock #	Description
MOR29106	Ball Knob -- Black
MOR46525	Teardrop Knob -- Black
MOR48485-001	T-Handle -- Side to side motion
MOR48485-002	T-Handle -- Straight Motion
MOR66344	Switch -- 1 Contact
MOR67113	Long Knob -- Black

Position Strips

Stock #	Description
MOR60544-002	F-N-R
MOR62714-002	On-Off
MOR62714-005	Off-On
MOR63308-001	Open-Closed
MOR63308-002	Closed-Open
MOR63611-002	Low-N-High
MOR63618-002	High-N-Low
MOR63633-001	Full-Idle
MOR63633-002	In-Out
MOR63633-003	Out-In
MOR63702-002	In-PTO-Out
MOR63702-004	Out-PTO-In
MOR63727-001	Down-N-Up
MOR63727-002	Up-N-Down
MOR63788-001	Fwd-Rev
MOR63788-002	Rev-Fwd
MOR63862-001	In-N-Out
MOR63862-002	Out-N-In
MOR63965-001	Fwd-N-Rev
MOR63965-002	Rev-N-Fwd
MOR64096-001	Idle-Full
MOR64420-001	Fast-Slow
MOR64420-003	Low-High
MOR64420-004	Slow-Fast
MOR66547-001	Throttle
MOR66905-001	R-N-F
MOR67164-002	High-Low

Docking Lights

For safe nightime boating--glare-free because they mount below the deckline. Mounted below the deckline in the bow or in the transom, Morse Docking Lights reveal the slightest projection above the water without the discomfort or danger of blinding backglare. They install in any hull type, even in extremely flared hulls, and they're completely adjustable. Light spreads evenly to port, starboard, and ahead for safe travel in unfamiliar channels or safe docking in congested areas.

Add to the beauty of your cruiser or runabout with Morse Docking Lights--the best safety investment you can buy.

Stock #	Description
MOR33007-012	Type R--12 volt-- 30,000 Candle power; draws 7-8 amps
MOR33007-028	Type R--28 volt-- 10,000 Candle power; draws 2-3 amps

Accessories & Parts

Stock #	Description
MOR10000	Switch Kit
MOR29971	Switch Nameplate
MOR33004-012	Replacement lamp assembly--12 volt
MOR33004-028	Replacement lamp assembly--28 volt
MOR61316	Hardware Bag--Type R
MOR304172	Type R Housing

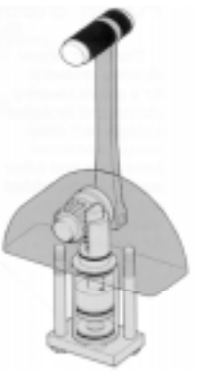
HYNAUTIC HYDRAULIC ENGINE CONTROLS offer the boat owner a very positive, synchronized method of relaying multi-station remote commands to the engine's throttle and transmission linkages.

Engine controls have been packaged into systems for complete and simple installation. Systems have been designed for up to three stations, using either nylon tubing or copper tubing. A fourth station is possible, depending upon the length of the tubing run. Nylon tubing is preferred because of ease of installation and the material's expansion characteristics.

The slave unit is designed to deliver up to 120 inch pounds of torque through 80 degrees of travel. Therefore, a system will accommodate marine engines and hydraulic transmissions used on most boats to 100 feet. These systems have also been adapted for operating bow thrusters and variable pitch propellers.

When the control handle of the Sending Unit is moved, mechanical energy is transformed into fluid energy by means of a rack and pinion attached to an internal piston. This piston expels fluid from the sending unit into all other control heads and the slave unit. The pistons in each of these units are thus moved an equal distance, causing a corresponding movement in the lever arm of each.

To control synchronization, the piston in each sender and slave contains two small valves. These are opened when the piston reaches the end of the stroke, allowing excess fluid to pass through the piston and into the system. Controls can be synchronized, if necessary, by rotating the lever arm of any control head from stop-to-stop.



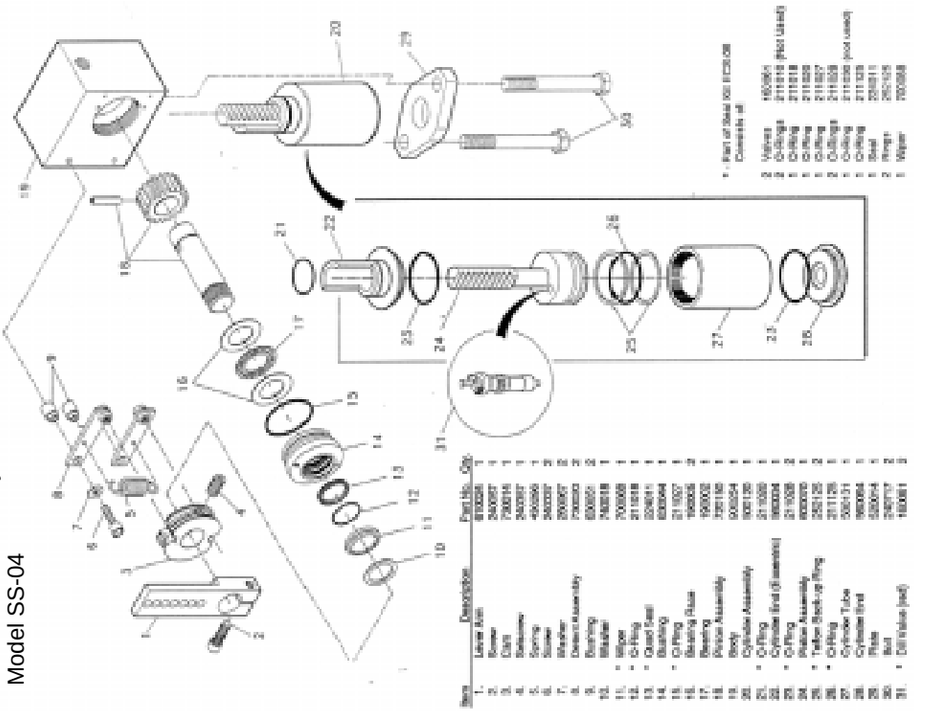
Sending Unit

R-13
Reservoir

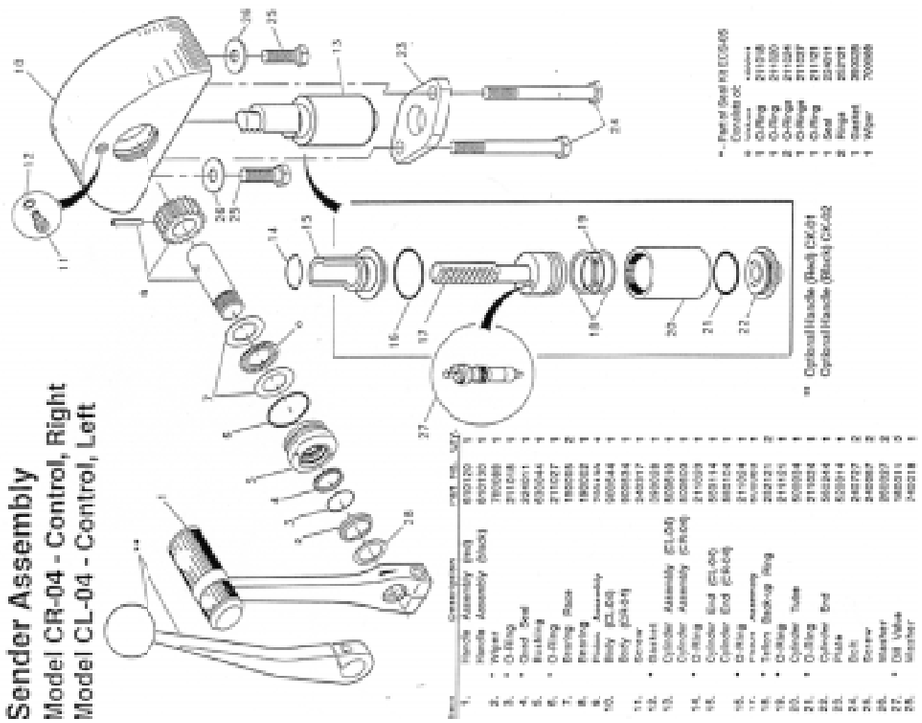
The Reservoir maintains the extra fluid and a constant pressure head (80 psi) for the system. The flow of fluid to and from the reservoir is regulated by the Charging Valve. As fluid expands due to engine temperatures, the excess liquid is expelled into the reservoir at a controlled rate. Likewise, fluid is returned to the system as temperatures drop.

Each Throttle Slave Unit contains an over-travel bungee in its linkage to the engine. This device assures that the slave piston will reach end stroke in each direction. Otherwise, the balance between senders and slave cannot be maintained. The transmission slave unit has a mechanical detent to indicate a neutral position. Each throttle slave is equipped with an external pilot check valve which prevents control arms from drifting back to an idle position.

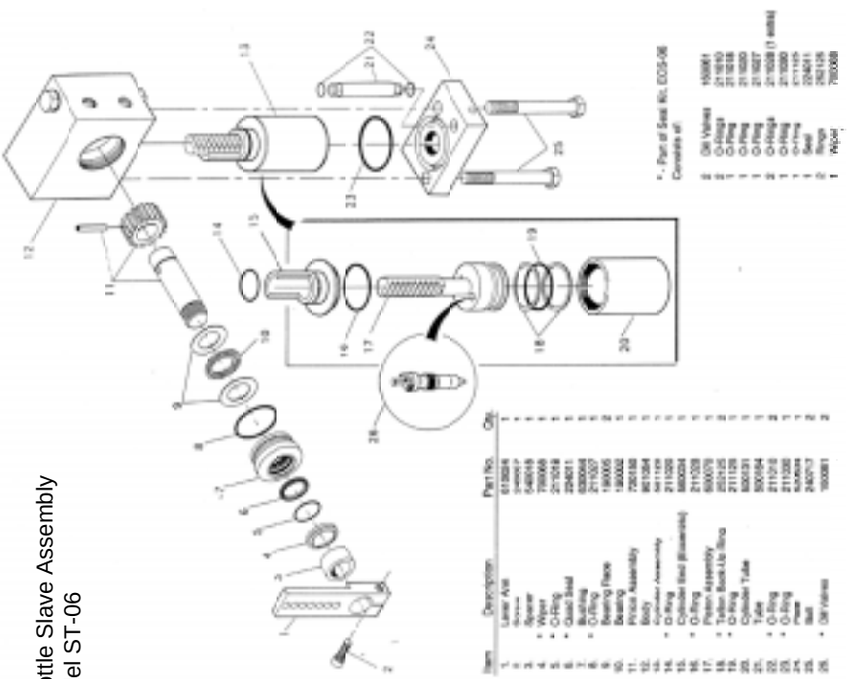
		SINGLE ENGINE						TWIN ENGINES					
COMPONENT PART	DESCRIPTION	MC-64-SI	MC-64-SIC	MC-64-S2	MC-64-S2C	MC-64-S3	MC-64-S3C	MC-64-T1	MC-64-T1C	MC-64-T2	MC-64-T2C	MC-64-T3	MC-64-T3C
R-13	Reservoir	1	1	1	1	1	1	1	1	1	1	1	1
MCVF-64	Valve Fittings	-	-	-	-	-	-	1	1	1	1	1	1
MCVF-65	Valve Fittings	1	1	1	1	1	1	-	-	-	-	-	-
CL-64	Control-left	1	1	2	2	3	3	2	2	4	4	6	6
CR-64	Control-right	1	1	2	2	3	3	2	2	4	4	6	6
CDF-64	Dual Mounting Plate	-	1	-	2	-	3	-	2	-	4	-	6
CF-64	Control Fittings	2	2	4	4	6	6	4	4	8	8	12	12
SS-64	Shift Slave	1	1	1	1	1	1	2	2	2	2	2	2
SSF-64	Slave Fittings	1	1	1	1	1	1	2	2	2	2	2	2
ST-100	Throttle Slave	1	1	1	1	1	1	2	2	2	2	2	2
STF-12	Slave Fittings	1	1	1	1	1	1	2	2	2	2	2	2



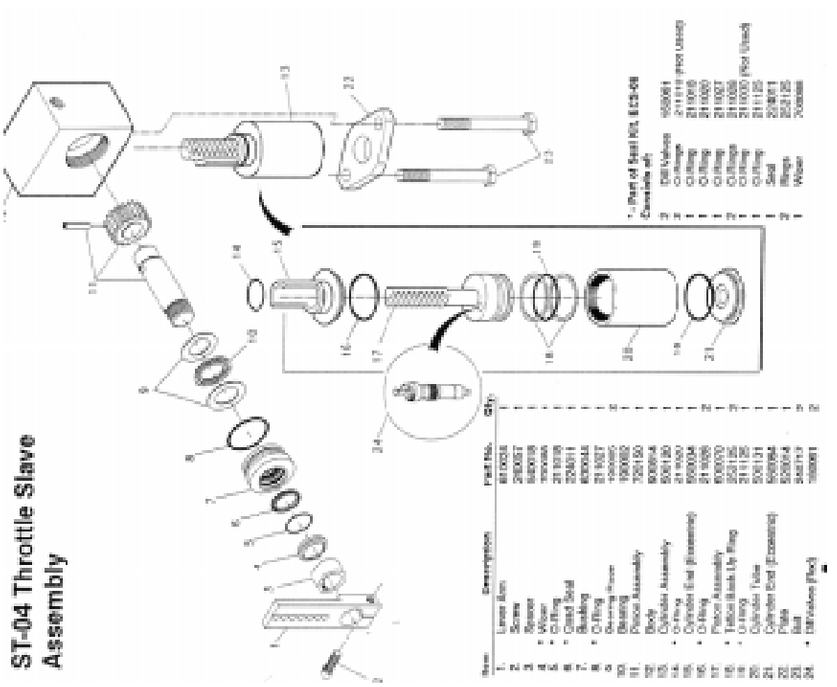
Shift Slave Assembly
Model SS-04



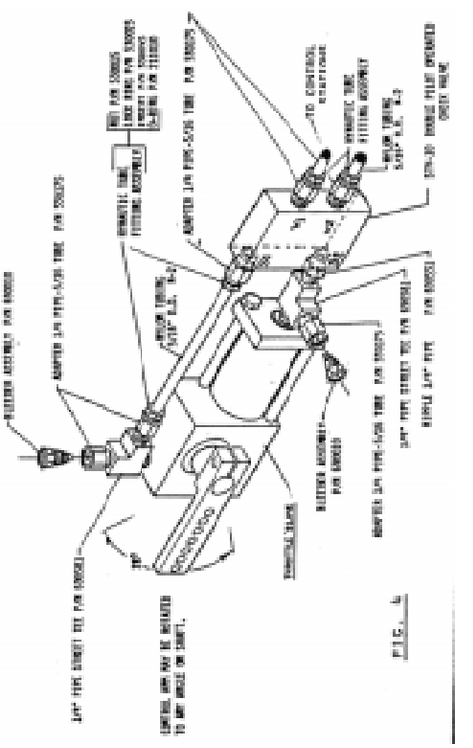
Sender Assembly
Model CR-04 - Control, Right
Model CL-04 - Control, Left



Throttle Slave Assembly
Model ST-06



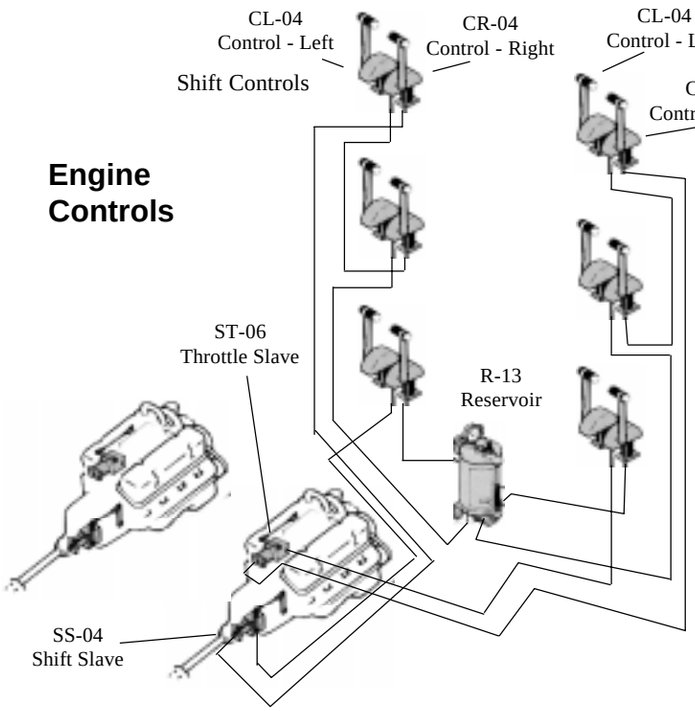
ST-04 Throttle Slave Assembly



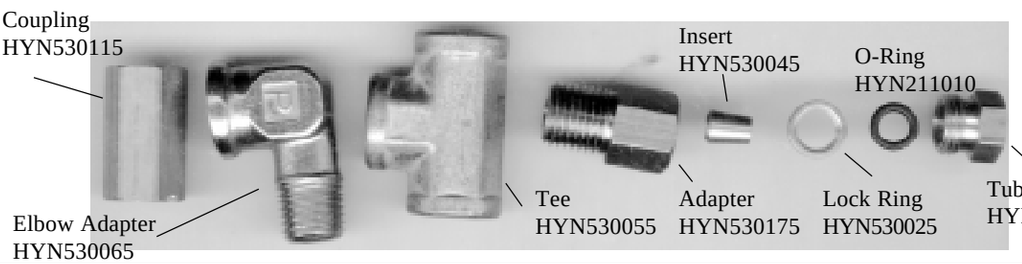
Seattle: (206) 285-5010 Fax: (206) 285-7925
Website: http://www.seamar.com

Call Toll Free: (800) 426-2783 8-5 M-F 9-1 Sat.
email: seamar@seamar.com

Engine Controls



Hynautic Engine Controls are easily adapted to 5/16" unplasticized nylon tubing. This tubing expands at a similar rate as the fluid, thus compensating for inevitable fluid expansion and contraction. The tubing is easy to install and special O-ring fittings are supplied with each System. Bleeding the System of air is accomplished in a manner similar to an automobile's brake system. Special patented bleeder fittings are provided. Systems for copper tube plumbing are also available.



Fittings for 5/16" O.D. Nylon Tubing, Unplasticized

Fittings for 3/8" O.D. Nylon Tubing, Unplasticized.

Fittings for 5/16" & 3/8" I.D. hose, reinforced.

How The Systems Work

HYNAUTIC MANUAL STEERING SYSTEMS ARE UNIQUE. The design of the patented helm pump features both a pump section which increases volumetric and mechanical efficiency, and a valve section which incorporates all the lockout capabilities.

Most Hynautic Systems are pressurized which prevents air from entering the system, helps to monitor system status and assists in purging.

All components are made exclusively for the marine environment, using materials and workmanship which offer longevity and safety for the most extreme conditions.

Under normal operating conditions, a clockwise turn of the steering wheel will send fluid from the Helm Unit into a starboard hydraulic line. This fluid will be pumped into the Cylinder and either extend or retract the cylinder rod. Outgoing fluid from the other end of the Cylinder is returned to the Helm Unit via the port side line. A smaller, central line, evident on all pressurized systems links the remote Reservoir with the helm.

There are four basic parts to any Hynautic Manual steering system. These are the Helm Unit, the Reservoir, the Relief Valve and the Cylinder. Each may be a separate component or, as in the case of the new 2-Line Compact System, the Reservoir and relief Valve are located within the Helm Unit. The components are connected by copper tubing or synthetic tubing or hose.

The patented Helm Unit consists of a hydraulic pump section and a valve section. The pump section contains one or two bidirectional piston pumps which are activated when the ship's wheel is rotated. Hydraulic fluid is efficiently pumped from this section through valves into the lines. The valve assembly located at the back end of the Helm Unit prevents outgoing fluid from returning, eliminates pump cavitation, isolates non-operating steering stations, locks the rudder and eliminates rudder "kickback" to the Helm wheel.

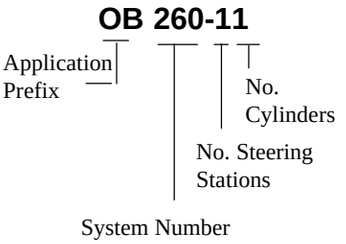
Fluid is added to the System at the Reservoir. For the 2-Line compact Helm, the 60, the Reservoir is part of the Helm Unit. For other pressurized systems, the Reservoir is a separate component which may be located anywhere in the system to conveniently monitor fluid level and system pressure.

The Relief Valve provides overpressure protection for both the mechanical steering linkages and the hydraulic lines and fittings. Relief pressure is factory set at either 500 psi or 950 psi. The new compact 60 Series Helm Unit used in the 2-Line compact systems has an internal relief valve. For pressurized compact systems, the relief valve is attached underneath the Reservoir in a single component called the Reservalve.

The Cylinders are double acting and may be balanced or unbalanced - the rod end extends through only one end of the Cylinder. Incoming fluid from the Helm Unit pushes a piston which is pinned to the external rod. As the piston is moved the rod is either extended or retracted.

System Numbering Code

There are many variables which are taken into consideration when ordering a compact steering system. The following numbering code illustrates how compact system numbers are derived:

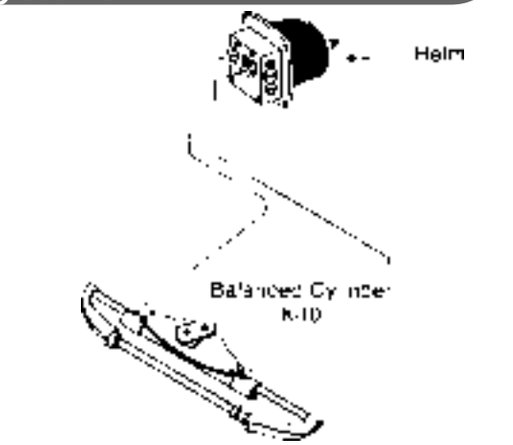


Compact Steering Systems

Outboard boats, I/O's and inboard boats to approximately 38 feet exert less force than larger yachts. Therefore, compact components were developed which, when applied properly, provide safe efficient steering at an economical price.

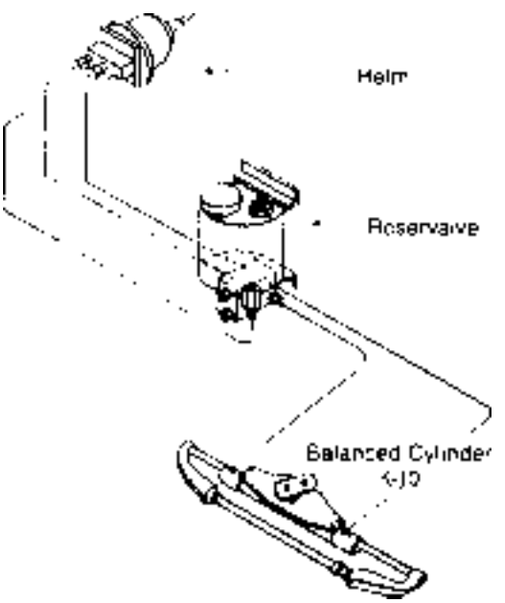
The Compact Steering System which incorporates these smaller components offer a complete steering package. Specific components have been assembled for ease of installation, minimum steering effort, and fewest turns.

Compact steering systems may have one of two pressure settings set at the factory. A low pressure system set at 500 psi is used on small boats with special unplasticized, light duty nylon tubing. For the high pressure systems the relief is set at 950 psi and only copper tubing or approved high pressure hose is recommended.



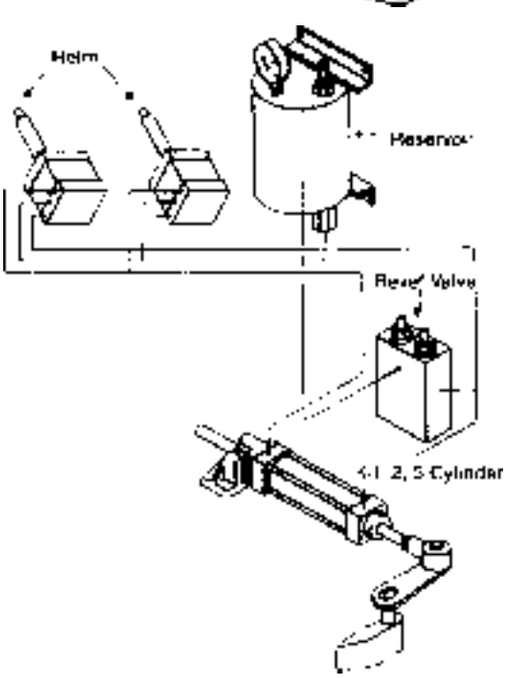
The NEW 2-Line System

Hynautic's new 2-Line Steering System incorporates all basic functions into just two components, the Helm and the Cylinder. Fluid fill is at the Helm. Special design makes purging easy.



Pressurized Compact System

Hynautic continues to offer the only pressurized compact steering systems available. The Reservoir is remote and the whole system is under a slight head pressure applied with a bicycle pump at the Reservoir. This system is the most cost effective on the market if you need to steer at more than one station.



Standard Systems

Standard Manual Steering Systems are for commercial and pleasure boats to 70 feet. The universal mount cylinders are easy to install and allow for the greatest degree of misalignment. The Relief Valve of all Standard Systems is set at 950 psi. Therefore, only copper tubing or braided hydraulic hose acceptable. Other types of tubing may have the correct pressure rating but might be too elastic, allowing easy energy loss and sluggish response.

The component parts of Standard Systems are matched to allow for the fewest number of turns and an acceptable steering effort.

The Standard System package is designed for a single steering station. To add additional Helms to the basic System, include another Helm Unit and the appropriate fitting package. (See the Fitting Package Section.)

OB Applications

Hynautic offers several different 2-Line hydraulic steering systems for outboard applications. They differ primarily in cylinder type, but also in the tubing required and the Helm Unit chosen. Consult the following charts and drawings to make your choice.

Some considerations:

1. Where a choice of systems with different wheel turns are provided, remember: The quicker the steering, the harder the effort.
2. When using Counter-Rotating propellers, the steering torque is half of what would be considered normal for dual engines.
3. Systems with low pressure relief settings (500 psi) include 50 feet of light duty 3/8" OD nylon tube. High pressure systems, with 600 series numbers, include adapter fittings for high pressure hose. Hose is purchased separately.
4. High pressure hose, with reusable end fittings, is available from Hynautic. Consult elsewhere in this catalog for particulars.

Outboard 2-Line System Applications

Engine Manuf.	Model	Type	No. Engines	Counter-Rotation	Hynautic System Front Mt. Cylinder	Hynautic System Side Mt. Cylinder
Johnson	100	V-4	1 or 2	N/A	-	OB260-11
&	120	V-4	1 or 2	N/A	-	OB260-11
Evinrude	140	V-4	1 or 2	Y or N	OB650-11	OB260-11
	150	V-6	1 or 2	Yes	OB650-11	OB610-11
	175	V-6	1 or 2	Yes	OB650-11	OB610-11
	175	V-6	2	No	OB650-11	OB610-11
	200	V-6	1 or 2	Yes	OB650-11	OB610-11
	200	V-6	2	No	OB650-11	OB610-11
	225	V-6	1 or 2	Yes	OB650-11	OB610-11
	225	V-6	2	No	OB1260-11	OB610-12
	300	V-8	1 or 2	Yes	OB1260-11	-
Mercury	135	V-6	1 or 2	Y or N	OB650-11	OB260-11
&	150	V-6	1 or 2	Yes	OB650-11	OB610-11
Mariner	175	V-6	1 or 2	Yes	OB650-11	OB610-11
	175	V-6	2	No	OB650-11	OB610-11
	200	V-6	1 or 2	Yes	OB650-11	OB610-11
	200	V-6	2	No	OB650-11	OB610-11
	250	V-6	1	N/A	OB650-11	OB610-11
	250	V-6	2	N/A	OB1260-11	OB610-12
	275	V-6	1	N/A	OB650-11	OB610-11
	275	V-6	2	N/A	OB1260-11	OB610-12
	100	V-4	1 or 2	N/A	-	OB260-11
Suzuki	140	4	1 or 2	N/A	OB650-11	OB260-11
	150	V-6	1 or 2	Yes	OB650-11	OB610-11
	175	V-6	1 or 2	Yes	OB650-11	OB610-11
	175	V-6	2	No	OB650-11	OB610-11
	200	V-6	1 or 2	Yes	OB650-11	OB610-11
	200	V-6	2	No	OB650-11	OB610-11
	225	V-6	1	N/A	OB650-11	OB610-11
	225	V-6	2	N/A	OB1260-11	OB610-12
	115	V-4	1 or 2	N/A	-	OB260-11
Yamaha	130	V-4	1 or 2	Yes	OB650-11	OB260-11
	150	V-6	1 or 2	Yes	OB650-11	OB610-11
	175	V-6	1 or 2	Yes	OB650-11	OB610-11
	175	V-6	2	No	OB650-11	OB610-11
	200	V-6	1 or 2	Yes	OB650-11	OB610-11
	200	V-6	2	No	OB650-11	OB610-11
	225	V-6	1 or 2	Yes	OB650-11	OB610-11
	225	V-6	2	No	OB650-11	OB610-11
	250	V-6	1	N/A	OB650-11	OB610-11
	250	V-6	2	Yes	OB1260-11	OB610-12

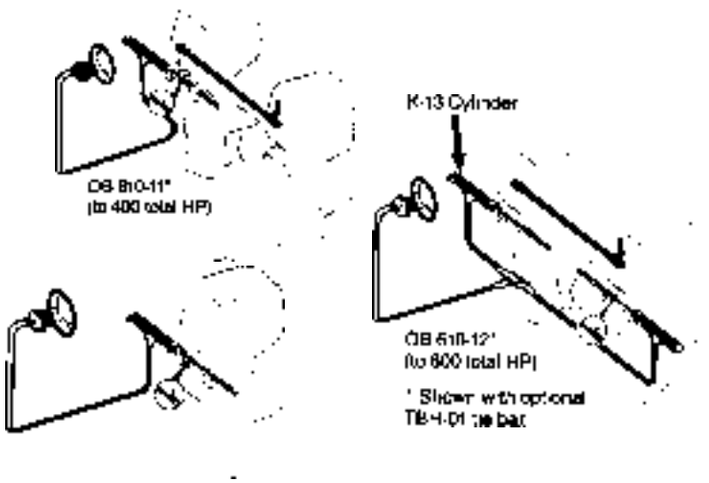
Outboard System Performance Data

System	Helm Displ. (cu. in.)	Helm Displ. (cm.)	Number Steer Cylinders	Relief Wheel Turns	Max Setting psi	Torque (in./lbs.)
OB260-11	2.0	33	1	5.5	500	4,500
OB261-11	2.0	33	1	5.5	500	4,500
OB610-11	2.0	33	1	5.5	950	8,550
OB610-12	2.75	45	2	7.3	950	18,900
OB611-11	2.0	33	1	5.5	950	8,550
OB611-12	2.75	45	2	7.3	950	18,900
OB650-11	1.65	27	1	4.5	950	7,500
OB650-12	2.75	45	2	5.5	950	15,000
OB1260-11	2.75	45	1	4.6	950	10,300

For Outboards with Side Mount Cylinders

OB 260 System
For single or twin outboards to 250 total HP, and 55 MPH boat speed. Advantages: system cost and simplicity of installation.

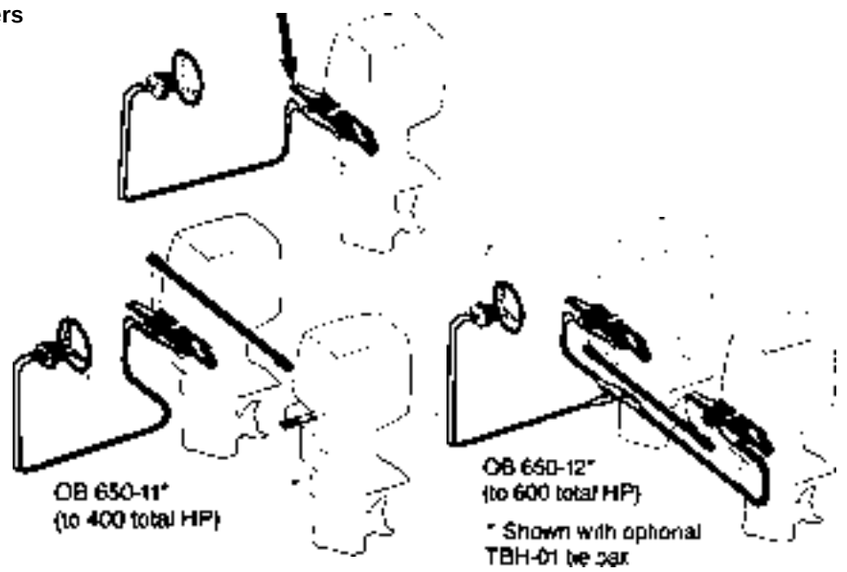
OB 610 System
The high pressure version of the OB 260 System above. For single or twin outboards to 600 HP and 55 MPH boat speed. No tubing provided in kit, must purchase high pressure hose separately.



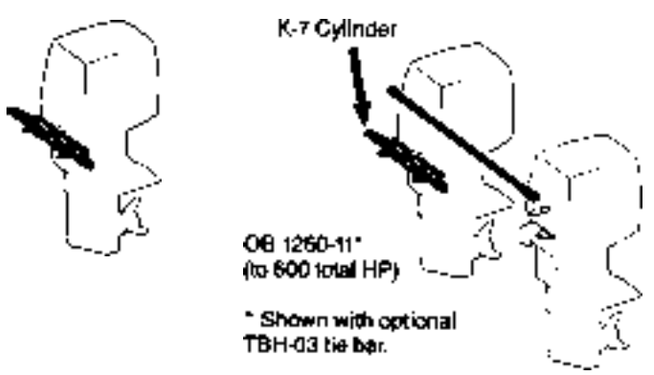
OB260-11 (to 225 HP)
or
OB610-11 (to 275 HP)

For Outboards with Front Mount Cylinders

OB 650 System
Uses the K-10 engine mount cylinder. For single or twin outboards to 600 total HP and 55 MPH boat speed. No tubing provided in kit, must purchase high pressure hose separately. Advantages: Quick steering, adapts to autopilots, rugged. For Mercury engines, also order a KF-100 Adapter Kit.
Dual engine applications require a separate tie bar attachment. For dual engines, order in addition to the appropriate OB 650 System: HYNOBKH-04 -Kit for Yamaha & OMC engines or HYNOBKH-08 - Kit for Mercury engines



OB 1260 System
The most powerful of all outboard systems; good for boat speeds to 65 MPH; uses a large K-7 cylinder. Advantages: power and smooth operation.



OB 1260-11
(to 600 total HP)

OB Applications

Hynautic offers several different pressurized compact steering systems for outboards. All have a remote Reservalve.

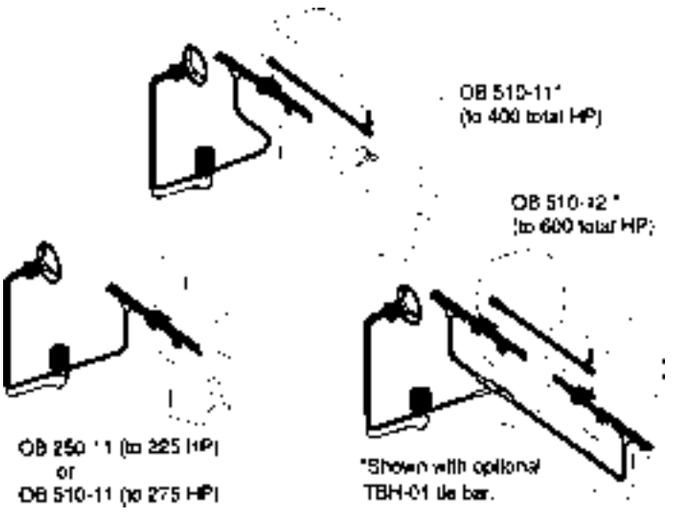
Tilt Tube Mount

OB 250 System

For single or twin outboards to 250 total HP, and 55 MPH boat speed. Basic unit includes Helm Unit, Reservalve, Cylinder, fittings, 50 feet of tubing and 2 quarts of fluid.

OB510 System

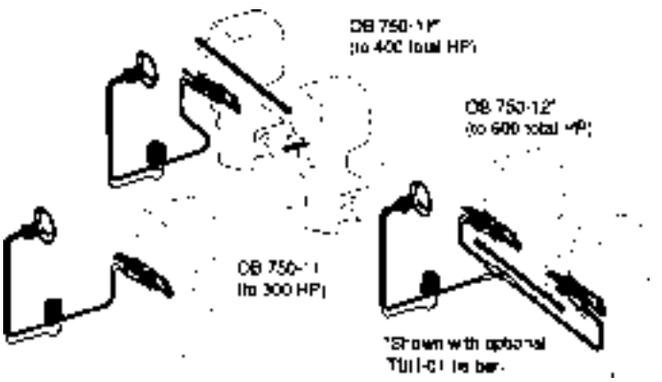
This kit contains identical components to the OB250 System above, except that the Reservalve relief setting is raised to 950 psi. Thus able to handle the steering pressures of larger outboards, the System requires the separate purchase of SAE 100R rated hydraulic hose.



Front Mount

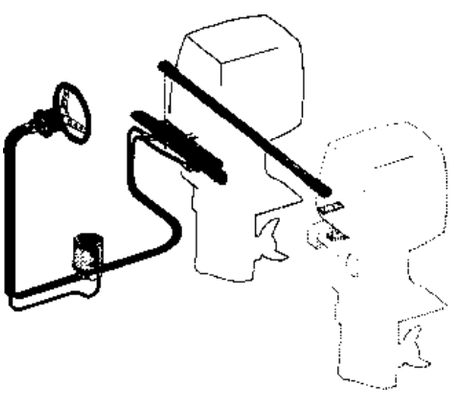
OB750 System

For single or twin outboards to 600 HP and 55 MPH boat speed, this system offers very quick response (4 turns HO with one cylinder). Included are the Helm Unit, Reservalve, Cylinder, two quarts of fluid and appropriate fittings for SAE 100R hose on the supply lines and nylon tubing on the take-up line.



OB 1250 System

Utilizes the larger K-7 cylinder for those applications where more power is necessary and boat speeds to 65 MPH. System is complete with appropriate Helm Unit, Reservalve, Cylinder, fittings and fluid.



OB 1250-11
(to 600 total HP)
***Shown with optional**
TBH-01 tie bar.

Hy-Trac Hynautic Steering System

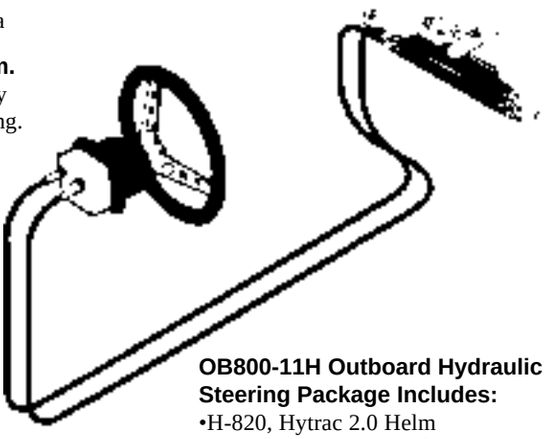
Packaged OB800-11H
Outboard Hydraulic Steering System.

For Single or Twin V4 and V6 engines

Featuring the new and revolutionary K-6 cylinder with its slim line profile and universal base-mount design.
Neatly mounts to all V4 and V6 engines without using the tilt tube!

Easily installs on:
Mercury/Mariner - Evinrude & Johnson - Suzuki - Yamaha

Also Featuring The New "Glide-Free" 80 Series Helm.
Eliminates Torque Feedback From Big Outboards So Every Member of the Family Can Enjoy Smooth, Effortless, Steering.



√ Extremely simple to install. System includes all necessary hardware and 50 feet of hose with attached helm fittings so you can custom cut the hose at the cylinder end to the exact length you need.

√ Ultra sleek cylinder design requires less space around the engine and improves the appearance of your boat.

√ Accepts port or starboard hose connections.

√ Helm mounts in front of or behind the dash and is powder coated for extra corrosion resistance and longer life.

√ Stainless steel helm shaft.

√ Unique no-mess purge kit. Bypass tube easily connects to cyinder, fill-tube connects to helm, then just rotate wheel to purge.

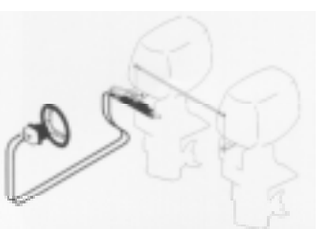
Yes...it really is that simple!
The ultimate in Compact Hydraulic Steering Systems. Everything You Need, Packaged in a Single Box.

OB800-11H Outboard Hydraulic Steering Package Includes:
- H-820, Hytrac 2.0 Helm
- K-6, Hy-Trac Universal Base-Mount Cylinder
- All Mounting Hardware fo Helm & Cylinder
- 50 feet Marine Steering Hose
- Hose Fittings Kit
- 1/2 Gallon of Hydraulic Fluid
- Complete Purging Kit
- Installation and Owner's Manual

Dual Stations
Order 1) H-820 Helm 1) HF42 Station Fittings, plus MSHS Hose and fittings as needed.

HY-TRAC APPLICATIONS

Engine Mfg.	Model	Type	No. Engines	Counter Rotation Present	Hy-Trac System Require	Engine Mfg.	Model	Type	No. Engines	Counter Rotation Present	Hy-Trac System Required
EVINRUDE & JOHNSON	90	V-4	1 OR 2	NO	HYNOB800-11	SUZUKI	90	V-4	1 OR 2	NO	HYNOB800-11
	115	V-4	1 OR 2	NO	HYNOB800-11		100	V-4	1 OR 2	NO	HYNOB800-11
	130	V-4	1 OR 2	YES OR NO	HYNOB800-11		115	4	1 OR 2	NO	HYNOB800-11
	150	V-6	1 OR 2	YES OR NO	HYNOB800-11		140	4	1 OR 2	NO	HYNOB800-11
	175	V-6	1 OR 2	YES OR NO	HYNOB800-11		150	V-6	1 OR 2	YES OR NO	HYNOB800-11
	200	V-6	1 OR 2	YES OR NO	HYNOB800-11		200	V-6	1 OR 2	YES OR NO	HYNOB800-11
	225	V-6	1	N/A	HYNOB800-11		225	V-6	1	N/A	HYNOB800-11
	225*	V-6	2	NO	HYNOB800-12		225*	V-6	2	NO	HYNOB800-12
	225	V-6	2	YES	HYNOB800-11		225	V-6	2	YES	HYNOB800-11
MERCURY & MARINER	75	3	1 OR 2	NO	HYNOB800-11	YAMAHA	115	V-4	1 OR NO	NO	HYNOB800-11
	100	4	1 OR 2	NO	HYNOB800-11		130	V-4	1 OR NO	YES OR NO	HYNOB800-11
	115	4	1 OR 2	NO	HYNOB800-11		150	V-6	1 OR NO	YES OR NO	HYNOB800-11
	125	4	1 OR 2	NO	HYNOB800-11		175	V-6	1 OR NO	NO	HYNOB800-11
	135	V-6	1 OR 2	YES OR NO	HYNOB800-11		200	V-6	1 OR NO	YES OR NO	HYNOB800-11
	150	V-6	1 OR 2	YES OR NO	HYNOB800-11		225	V-6	1	N/A	HYNOB800-11
	175	V-6	1 OR 2	YES OR NO	HYNOB800-11		225*	V-6	2	NO	HYNOB800-12
	200	V-6	1 OR 2	YES OR NO	HYNOB800-11		225	V-6	2	YES	HYNOB800-11
	225	V-6	1	N/A	HYNOB800-11		250	V-6	1	N/A	HYNOB800-11
	225*	V-6	2	NO	HYNOB800-12		250*	V-6	2	YES OR NO	HYNOB800-12
	225	V-6	2	YES	HYNOB800-11	* Application requires additional cylinder and tie-bar kit					
	250	V-6	1	N/A	HYNOB800-11						
	250*	V-6	2	NO	HYNOB800-12						



Can also be used for twin engines (up to 450 total HP) with purchase of tie-bar kit.

Can also be used for twin engines (up to 500 total HP) with purchase of tie-bar kit and additional K-6 cylinder.

2-Line Systems

2-Line compact steering systems for small inboard boats are generally for boats under 38 feet. However, the application depends upon many factors, including rudder size and angle, boat speed, and boat use. The System Selection Guide is intended for general application. In addition, the following general rules apply:

1. When possible, match known rudder torque with cylinder output to determine proper steering system.
2. When in doubt, use the largest recommended system. Use a high pressure (950 psi relief) system whenever possible.
3. The system operating pressure should not exceed half the system relief pressure. (This may be hard to determine without gauges, but remember that two-handed wheel effort usually begins at about 400 psi line pressure.)

IB 611 System

A high pressure steering system which requires high pressure hose (order separately). For planing boats to 35 feet with heavy steering loads.

IB 261 System

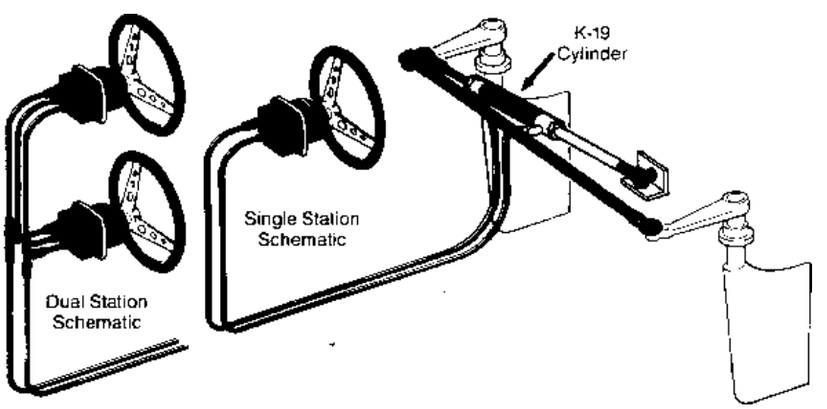
This system has a low pressure relief and uses nylon tubing throughout. Cylinder has ball joint mount on both ends. Advantages: Cost, ease of installation.

IB 631 System

The premier small inboard steering system featuring the most powerful cylinder, the K-51, and high pressure lines (order separately). For most planing pleasure boats to 38 feet.

IB 631 Steering System Performance Data

System	Helm Displacement cu. in.	cu. cm.	Number Steer Cylinders	Wheel Turns	Relief Setting (psi)	Max Torque* (in./lbs.)
IB261-11	2.0	33	1	4.3	500	3,310
IB611-11	2.0	33	1	4.3	500	6,290
IB631-11	2.0	45	1	5.1	1000	6,900



Steering for Inboards to 70 ft.

Hynautic has packaged three systems to meet most large boat steering needs to 70 feet. Other cylinders and helms may be substituted to gain more force or less turns.

MS 1150 System
This system for most boats to 40 feet combines the K-1 cylinder with a 20 series Helm Unit, giving 4.4 turns hardover-to-hardover. The system includes a Helm Unit, Cylinder, Relief Valve, Reservoir and fittings for 3/8" copper lines or the equivalent in SAE-100R hydraulic hose.

MS 1175 System
For most pleasure boats to 50 ft. and work boats to 40 ft., this system combines the K-2 Cylinder with a 40 series Helm Unit. The result is 4.4 turns hardover-to-hardover. The basic system includes a Helm Unit, Cylinder, Relief Valve, Reservoir and fittings for 1/2" copper lines or SAE-100R hydraulic hose equivalent.

MS 1200 System
For most pleasure boats to 60 feet and work boats to 50 feet, this system uses the K-3 Cylinder and 40 Series Helm Unit. One configuration results in 5.8 turns, the other 4.2 turns. The basic system includes a Helm Unit, Cylinder, Relief Valve, Reservoir and fittings for 1/2" copper lines or SAE-100R hydraulic hose equivalent.

System Performance

System	Turns	Cylinder	Helm	Relief Valve	Torque @ 35°
MS 1150	4.4	K-1	H-21/25	950psi	9,650 in./lbs.
MS 1175	4.4	K-2	H-42	950 psi	14,300 in./lbs.
MS 1200	5.8	K-3	H-42	950 psi	18,500 in./lbs.
MS 1200	4.2	K-3	H-41	950 psi	18,500 in./lbs.

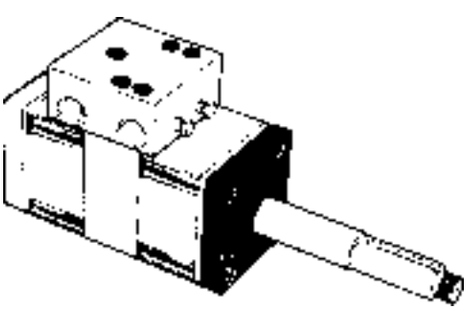
Standard systems utilize single cylinders. Dual cylinders systems are available. Output torque will double.

System Components

Universal Mount Cylinder
The K-1, K-2, and K-3 Cylinders are brass with a manganese bronze universal mount. All three have 9" stroke. Ball joints for mounting on the rudder arm are standard; clevis is optional.

H-20/40 Series Helm
The T-6061 aluminum body houses a non-metallic axial piston pump and internal valving. Stainless steel shaft with wiper seal is standard. Smaller helms are the 20 series; larger are the 40 series. Choice of tapered or straight shafts.

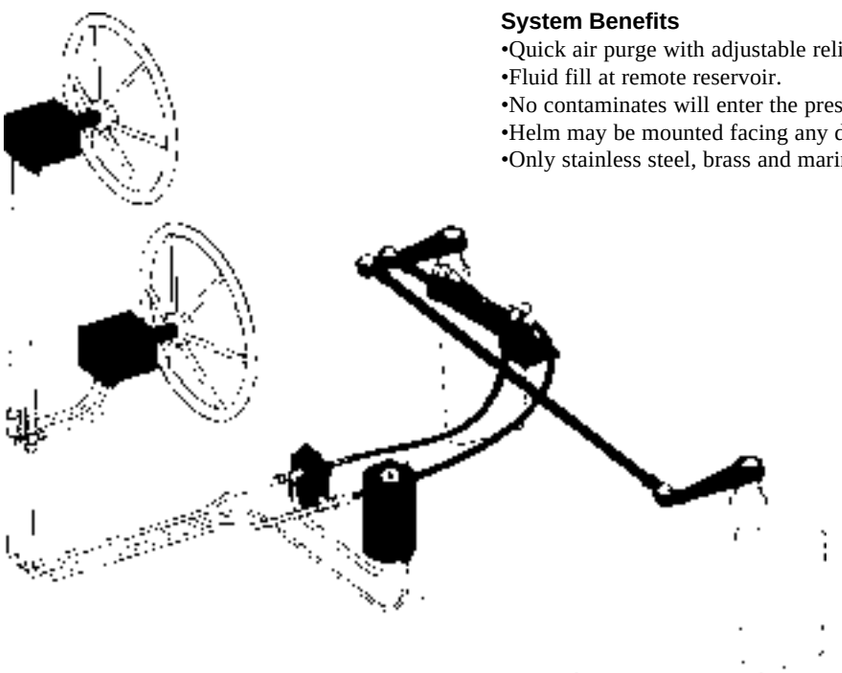
R-06 Reservoir
The R-06 Reservoir is the fill location and fluid reserve for the system. The R-06 filters the fluid entering the system. Standard features include a fluid level indicator and pressure guage. Options are integral hand pump and pressure relief valve. Two quart capacity.



System Selection Guide

SYSTEM	DISPLACEMENT HULLS														PLANING HULLS		
	Tug Boats & Net Haulers LOA			Work & Pleasure Boats LOA			Sail boats Skeg Rudder LOA		Maximum Area		Spade Rudder LOA		Maximum Area		LOA		HP
	ft.	m.	HP	ft.	m.	HP	ft.	m.			ft.	m.			ft.	m.	
MS 1150	TO 30	6-9	200	TO 40	9-12	300	TO 40	9-12	9	.9	TO 40	9-12	7	.6	35-50	10-15	450
MS 1175	TO 35	6-9	250	TO 45	12-14	350	40-45	12-14	10	1	TO 45	12-14	8	.7	40-50	10-15	750
MS 1200	26-40	8-12	400	40-55	12-17	500	40-52	12-16	17	1.6	35-46	12-14	15	1.4	45-60	14-18	950
MS 2175	30-45	9-14	450	45-65	14.20	600	50-60	15-18	18	1.7	40-50	12-15	15.5	1.4	55-65	17-20	1200
MS 2200	TO 50	TO 15	500	TO 75	TO 23	750	TO 65	TO 20	20	1.9	TO 60	TO 18	16.5	1.5	TO 70	TO 21	1500

* Special kits and Helms are available to provide rudder "feedback". Consult Hynautic or your distributor.
The above guidelines are for reference. System selection should be based on the torque limitations.



System Benefits

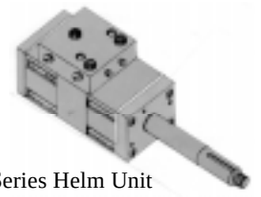
- Quick air purge with adjustable relief valve.
- Fluid fill at remote reservoir.
- No contaminates will enter the pressurized system.
- Helm may be mounted facing any direction.
- Only stainless steel, brass and marine aluminum exposed.

Systems & Components

Part #	Part Name	SYSTEM COMPONENTS MS 1150-21-1	MS 1175-21-1	MS 1175-42-1	MS 1200-42-1	MS 1200-41-1	MS 2175-41-1	MS 2200-41-1
H-21 or H-25	HELM UNIT	1	1					
H-41	HELM UNIT					1	1	1
H-42	HELM UNIT			1	1			
HF-10	HELM FITTINGS	1	1					
HF-21	HELM FITTINGS			1	1	1	1	1
MSV-21	RELIEF VALVE	1	1	1	1	1	1	1
MSVF-07	RELIEF FITTINGS	1	1					
MSVF-13	RELIEF FITTINGS			1	1	1	1	1
R-08	RESERVOIR	1	1	1	1	1	1	1
MSRF-01	1/2" COPPER FITTINGS			1	1	1	1	1
K-1B**	CYLINDER	1						
K-2B**	CYLINDER		1	1			2	
K-3B**	CYLINDER				1	1		2
KF-05	CYLINDER FITTINGS	1	1					
KF-60	CYLINDER FITTINGS			1	1	1	2	2
KH-01	CYLINDER BOLT	1	1	1	1	1	2	2

* Contains pair 2' hoses.
** Ball joint end. Clevis available.

20 Series Helm Unit



40 Series Helm Unit

Standard Helms

Hynautic Standard Helm Units combine one or two bi-directional axial piston pumps with pilot check and make-up check valving. The result is a unit which prevents rudder feedback, is very efficient (even at low rpm) and is immediately adaptable to multi-station use.

	Stock #	Displ.	Shaft Style Diameter & Type	Keyway	Integral Valving	Dimensions Shaft Length	Overall Length	Width
20 Series	HYNH-21	2.75	1" Straight	1/4" Square	Yes	6-1/8"	10-3/4"	3-1/2"
	HYNH-23	2.75	1", 3-1/2"/ft.Tapered	#9 Woodruff	Yes	5-1/4"	9-7/8"	3-1/2"
	HYNH-25	2.75	3/4", 1"/ft. Tapered	#9 Woodruff	Yes	5-1/2"	10-1/8"	3-1/2"
	HYNH-26	2.0	3/4", 1"/ft. Tapered	#9 Woodruff	Yes	5-1/2"	10-1/8"	3-1/2"
	HYNH-31	2.75	1" for Edson	1/4" Square	Yes	6-1/8"	10-3/4"	3-1/2"
	HYNH-35	2.75	1" Straight	1/4" Square	No	6-1/8"	10-3/4"	3-1/2"
40 Series	HYNH-41	5.5	1" Straight	1/4" Square	Yes	6-1/8"	13-5/8"	5-1/8"
	HYNH-41-01	5.5	1", 3-1/2"/ft. Tapered	#9 Woodruff	Yes	5-1/4"	12-3/8"	5-1/8"
	HYNH-41-02	5.5	3/4", 1"/ft. Tapered	#9 Woodruff	Yes	5-1/2"	13"	5-1/8"
	HYNH-42	4.0	1" Straight	1/4" Square	Yes	6-1/8"	13-5/8"	5-1/8"
	HYNH-42-01	4.0	1", 3-1/2"/ft. Tapered	#9 Woodruff	Yes	5-1/4"	12-3/4"	5-1/8"
	HYNH-42-02	4.0	3/4", 1:/ft. Tapered	#9 Woodruff	Yes	5-1/2"	13"	5-1/8"
	HYNH-45	4.0	1" Straight	1/4" Straight	No	6-1/8"	13-5/8"	5-1/8"

Autopilot Helms

These helm units are designed for attachment to mechanical autopilots with chain and sprocket.

Stock#	Displ.	Shaft Style Diameter & Type	Internal Keyway	Check Valve	Dimensions A	B	C
HYNH-29	2.75	1" Straight	#15 Woodruff	Yes	1-3/4"	6-1/2"	3-1/2"
HYNH-30	2.00	1" Straight	#15 Woodruff	Yes	1-3/4"	6-1/2"	3-1/2"

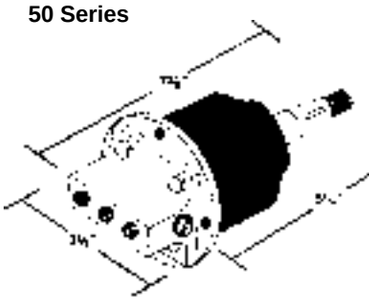
Compact Helms

For boats 38 feet and under.

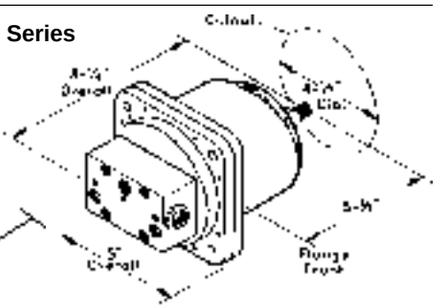
Hynautic's compact helms are designed to integrate with their smaller cylinders. The helm unit consists of a pump section and a valve section which includes an internal pilot check for multiple station operation.

Two compact helms are offered. The **50 Series** is used with a remote reservoir to complete a Hynautic 3-Line (Pressurized) steering system. The **80 Series** compact helm, with internal reservoir and relief valve, swash plate design hydraulic cylinder, and tubing is needed to complete 2 line systems.

50 Series



80 Series



80 Series

3/4" Tapered Stainless Shaft.

Stock #	Displacement (Cu. in.)	Displ. (Cu. in.)
HYNH-816	1.6	26
HYNH-820	2.0	33
HYNH-824	2.4	39

50 Series

3/4" Tapered Stainless Shaft
Lockout and Diverter Valve.

Stock #	Displacement (Cu. in.)
HYNH-50	2.00
HYNH-51	2.75
HYNH-52	1.65

Reservoirs

Made of T-6061 aluminum, Reservoirs are pressure tested for a minimum of 100 hours and shipped complete with front-reading pressure guage, fluid level indicator and return line filter.

Stock #	Dimensions A	B	C
HYNR-06	9-1/2"	13-5/8"	4-7/8"
HYNR-07	9-1/2"	14-5/8"	4-7/8"
HYNR-09	9-1/2"	14-5/8"	5-1/2"
HYNR-11	6"	10-5/8"	4-7/8"

Reservoir Specifications

Specifications

Stock #	Capacity	Optional Hand Pump	Special Notes
HYNR-06	2 qt.	No	Standard Model
HYNR-07	2 qt.	Yes	-----
HYNR-09	2 qt.	No	15 PSI Relief on top
HYNR-11	1 qt.	Yes	-----

Reservalves

The Reservalve combines the function of reservoir and relief valve into a single component. The relief portion of the reservalve is factory set at either 500 psi or 950 psi. Made of T-6061 aluminum, the reservalve is complete with front or top reading guage, fluid level indicator, and return line filter. Relief valve is flowing thru style from either direction to accomodate either portside or starboard mounting.

	Dimensions		
Stock #	A	B	C
HYNRV-50	6"	9-1/4"	4-1/2"
HYNRV-55	6"	9-1/4"	4-1/2"
HYNRV-57	6"	10-3/8"	4-7/8"
HYNRV-60	6"	9-1/4"	4-7/8"
HYNRV-67	6"	10-1/4"	4-7/8"

Relief Valves

These special relief valves are factory set for either 500 psi or 950 psi. They are intended to protect the system's components and assist in purging air.

	Dimensions		
Stock#	A	B	C
HYNMSV-19	3-7/8"	2-1/2"	1"
HYNMSV-21	3-7/8"	2-1/2"	1"
HYNMSV-35	4-1/2"	2-1/2"	1-1/2"

Relief Valves Specifications

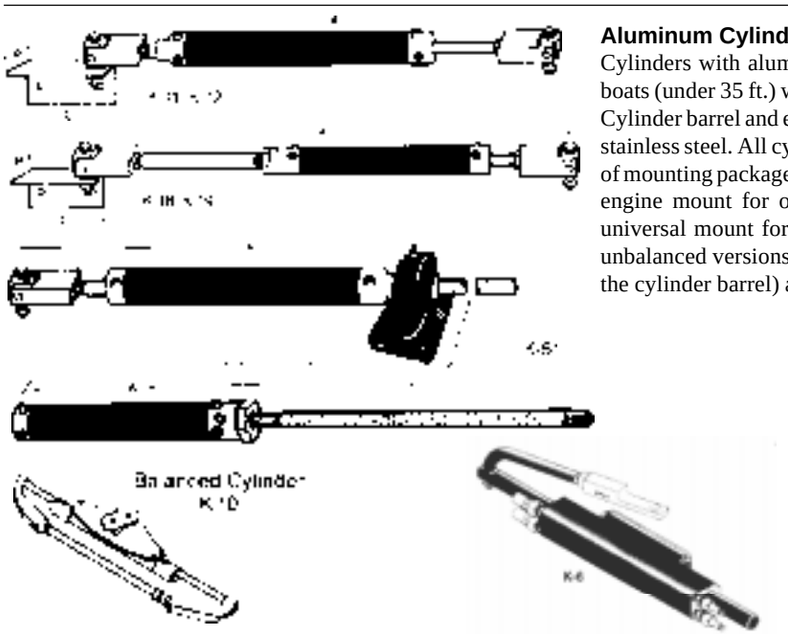
Specifications

Stock #	Relief Setting (psi)	Port Size	Special Notes
HYNMSV-19	500	1/4-20 NPT	------
HYNMSV-21	950	11/4-20 NPT	Std. w/steering systems
HYNMSV-35	950	1/4-20 NPT	w/pilot check valve

Reservalves Specifications

Specifications

Stock #	Capacity	Relief Setting (PSI)	Guage Style	Optional Hand Pump	Special Notes
HYNRV-50	1 qt.	500	Top Read	No	For 5/16" Nylon
HYNRV-55	1 qt.	500	Top Read	No	For 3/8" Nylon
HYNRV-55P	1 qt.	500	Top Read	Yes	For 3/8" Nylon
HYNRV-57	1 qt.	500	Top Read	Yes	For 5/16" Nylon
HYNRV-60	1 qt.	950	Top Read	No	----------
HYNRV-67	1 qt.	950	Front Read	Yes	----------



Aluminum Cylinders

Cylinders with aluminum barrels and end caps are designed for the smaller boats (under 35 ft.) where steering loads are less than 10,000 in. lbs. of torque. Cylinder barrel and ends are anodized T6061 aluminum. Cylinder rods are 303 stainless steel. All cylinders have replaceable wiper seals. There are four types of mounting packages: tube mount for direct attachment to outboards and I/O's; engine mount for outboards; ball joint mount for I/O's and inboards, and universal mount for inboards. Cylinders are available in both balanced and unbalanced versions. Balanced cylinders (rod protrudes through both ends of the cylinder barrel) are preferred if you are adding an autopilot to the system.

	Dimensions		
Stock #	A*	B	C
HYNK-6	22.55	5.5	2.5
HYNK-10	25.6	5.5	2.5
HYNK-11	18.25	2.0	3.5
HYNK-12	16.25	2.0	3.5
HYNK-13	13.6	13.5	---
HYNK-14	11.6	13.5	---
HYNK-18	24.5	2.1	3.5
HYNK-19	28.5	2.1	3.5
HYNK-51	24.25	3.6	16.0

*with rod retracted. All ball joint studs are 1/2", except rod end of K-11 and K-12 which are 3.8".

Aluminum Cylinders Specifications

Stock #	Type of Mount	Balanced or Unbalanced	Bore	Stroke	Displ. (Cu. In.)	Output Force (lbs) 500 PSI Relief	Output Force (lbs) 950 PSI Relief
HYNK-6	Base Mount	Balanced	1-1/2"	7-3/4"	9.0	---	
HYNK-10	Engine	Balanced	1-1/4"	9-1/2"	7.5	---	750
HYNK-11	Ball Joint	Unbalanced	1-1/4"	9"	11	515	950
HYNK-12	Ball Joint	Unbalanced	1-1/4"	7"	8.6	515	950
HYNK-13	Tube	Unbalanced	1-1/4"	9"	11	515	950
HYNK-14	Tube	Unbalanced	1-1/4"	7"	8.6	515	950
HYNK-18	Ball Joint	Balanced	1-1/4"	7"	7	515	950
HYNK-19	Ball Joint	Balanced	1-1/4"	9"	9	515	950
HYNK-51	Universal	Balanced	1-1/2"	7"	10.2	730	1390

Cylinders

Brass Cylinders

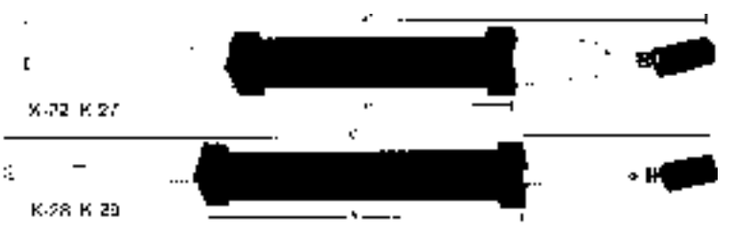
Brass Cylinders are for use on larger boats (to 70 ft. approximately). Tubes, ends, and external tie rods are brass; cylinder rods are 303 stainless steel; mounts are manganese bronze. These are three types of mounting packages: universal mount (the most common are recommended), fixed mount, and pivot mount. The K-5 cylinder is the only unbalanced brass cylinder and is nickel plated because it is most used externally for large performance I/O's

	Dimensions			
Stock #	A*	B	C	D
HYNK-1	25.9	16.6	2.75	4.5
HYNK-2	26.2	18.25	4.0	5.75
HYNK-3	26.2	18.25	4.0	5.75
HYNK-4	32.2	21.25	4.0	5.75
HYNK-5	20.75	17.25	2.75	4.5
HYNK-8	28.4	23.9	4.5	7.6

*with rod retracted. Add .12" for clevis.

Fixed Mount Cylinders

Fixed Mount Cylinder

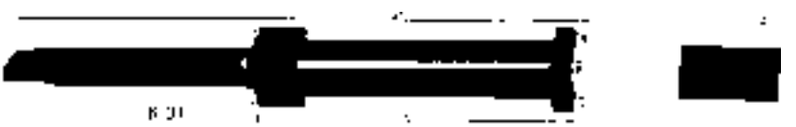


	Dimensions	
Stock#	A*	B
HYNK-22	34.12	13.25
HYNK-27	36.75	13.25
HYNK-28	36.75	15.25
HYNK-29	34.12	15.25

*rod centered

Pivot Mount Cylinders

Pivot Mount Cylinders



	Dimensions	
Stock #	A*	B
HYNK-31	38.37	14.12

*rod centered

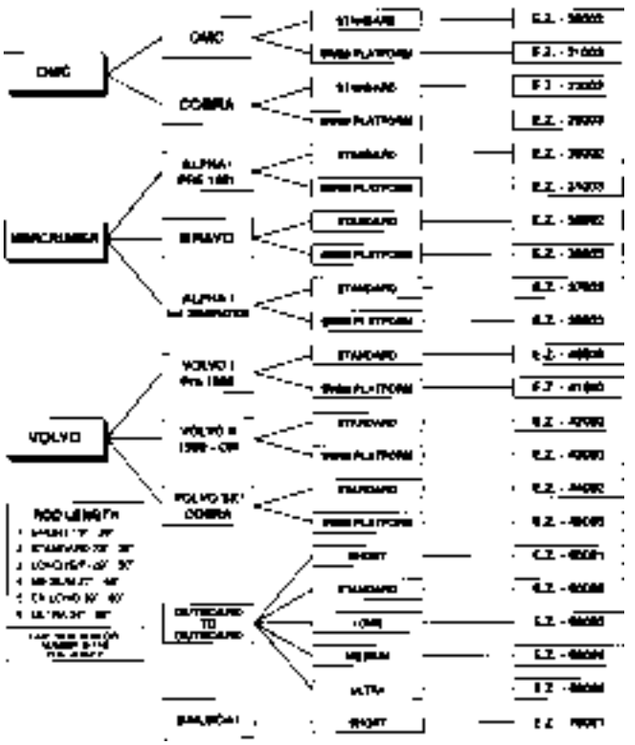
Specifications for Cylinders

Specifications

Stock #	Type of Mount	Balanced or Unbalanced	Rod Attachment	Bore	Stroke	Rod Dia.	Pin Dia.	Displ[1] (Cu. In.)	Output[2] Force (lbs.)
HYNK-1-B	Universal	Balanced	Ball Joint	1-1/2"	9"	3/4"	3/4"	12.1	1,250
HYNK-1-C	Universal	Balanced	Clevis	1-1/2"	9"	3/4"	1/2"	12.1	1,250
HYNK-B-2-B	Universal	Balanced	Ball Joint	1-3/4"	9"	3/4"	3/4"	17.6	1,850
HYNK-2-C	Universal	Balanced	Clevis	1-3/4"	9"	3/4"	5/8"	17.6	1,850
HYNK-3-B	Universal	Balanced	Ball Joint	2"	9"	7/8"	3/4"	23.1	2,400
HYNK-3-C	Universal	Balanced	Clevis	2"	9"	7/8"	3/4"	23.1	2,400
HYNK-4-B	Universal	Balanced	Ball Joint	1-1/2"	12"	7/8"	3/4"	30.5	2,400
HYNK-4-C	Universal	Balanced	Clevis	1-1/2"	12"	7/8"	3/4"	30.5	2,400
HYNK-5	Universal	Unbalanced	Ball Joint	1-1/2"	9"	7/8"	3/4"	12.8	1,350
HYNK-6	Base	Balanced		1-1/2"	7-3/4"			9.0	
HYNK-8	Universal	Balanced	Clevis	2-1/2"	9-1/2"	1"	3/4"	39.2	3,900
HYNK-22	Fixed	Balanced	Ball Joint[3]	1-1/2"	10"	3/4"	---	13.3	1,250
HYNK-27	Fixed	Balanced	Ball Joint	1-1/2"	10"	3/4"	---	13.3	1,250
HYNK-28	Fixed	Balanced	Ball Joint	1-1/2"	12"	3/4"	---	16.0	1,250
HYNK-29	Fixed	Balanced	Ball Joint[3]	1-1/2"	12"	3/4"	---	16.0	1,250
HYNK-31	Pivot	Balanced	Clevis	2"	10"	7/8"	3/4"	25.5	2,400

1. Measured at the head end of the cylinder.
2. Measured at the rod end of the cylinder.
3. Located on one rod end.

E.Z. Steer Auxiliary Outboard Steering System



Steering your Auxiliary Motor Couldn't be "E.Z."er.

- Increases safety and convenience
- Lets you steer your auxiliary engine from your boat's main wheel
- No more steering while hanging over the transom with a restricted view
- The patented self-adjusting, stainless steel rod attaches between your boat's main and auxiliary engines
- There is no need to disconnect the unit to make a main power run
- As long as you can steer your main engine, you'll be able to steer your auxiliary, even if one is raised or tilted
- It's the only self-adjusting auxiliary steering rod
- Perfect for hassle free trolling and boating
- Made in USA using DuPont® Delrin ball joints with brass inserts for rust resistance
- Mounting brackets are vinyl coated stainless steel
- Full one year limited warranty against defects in materials and workmanship

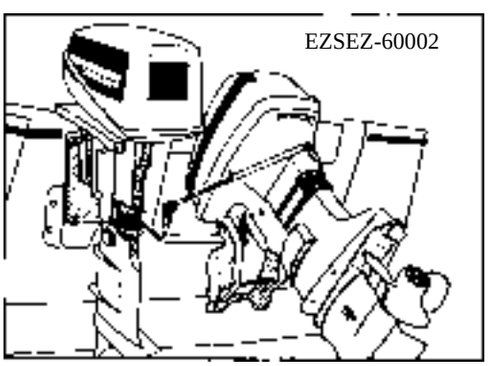
For safer and easier trolling and boating. E.Z. Steer has a kit to fit every outboard and outdrive engine, even if you have a swim platform. The rod comes ready to install in six standard lengths, ranging from 19 to 60 inches.

To find the proper compressed length your boat requires, measure from the center of your auxiliary to the center of your main engine with both engines down and straight ahead.

Remember, when mounting on a full or 3/4 swim platform, a special bracket and long rod are required. Custom length rods are available on a special order basis.

Short Rod kits are generally needed when the auxiliary is transom mounted and standard kits are used when the auxiliary is mounted on a lift bracket.

Arima kits are available for use with Arima boats. Seadrives or extended bracket outboards usually require a Long, Ultra, Extra Long or Custom rod.


EZSEZ-60002

Each full kit consists of:

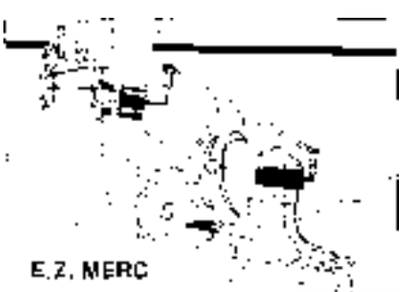
- Main bracket assembly
- Small outboard bracket assembly
- All necessary hardware
- One of the following self-adjusting rods:

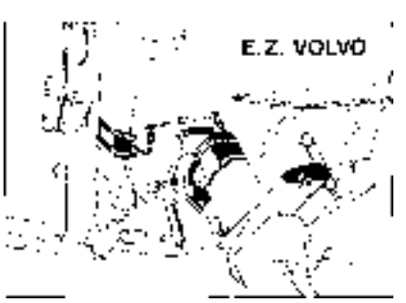
Short Rod	19"-29"
Standard Rod	23"-36"
Arima Rod	27"-48"
Long Rod	29"-50"
Ultra Rod	34"-58"
Extra Long Rod	39"-60"

Custom Length Rods Also Available

Stock #	Description
EZSEZ-10003	Long rod assembly complete
EZSEZ-10004	Arima rod assembly complete
EZSEZ-20002	OMC standard kit
EZSEZ-22002	OMC Cobra standard kit
EZSEZ-30002	Mercury Alpha I standard kit
EZSEZ-37002	Mercury Alph 1/2G standard kit
EZSEZ-40002	Volvo I standard kit
EZSEZ-42002	Volvo II standard kit
EZSEZ-60001	Short outboard to outboard kit
EZSEZ-60002	Standard outboard to outboard kit

E.Z. OMC


E.Z. MERC



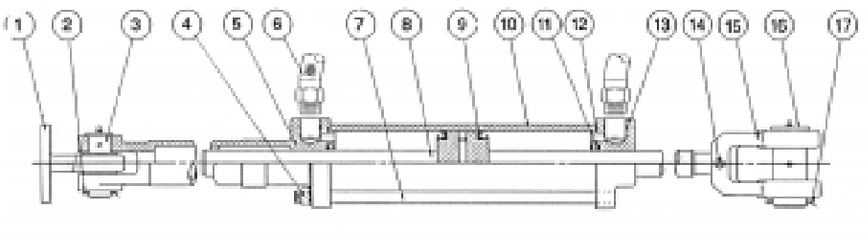
Wagner N Series

Cylinder

Stock #	Description
WGR700-0011	N65
WGR700-0012	N85

Parts:

Stock #	Description
WGR119-0016	Seal Kit
WGR740-0009	Clevis
WGR740-0010	Clevis Pin



Wagner N Series

Cylinders

Stock #	Description
WGR700-0048	N40-120
WGR700-0049	N40-190

Parts:

Stock #	Description
WGR119-0082	Seal Kit N40
WGR710-0003	Rod End

Cylinder

Stock #	Description
WGR700-0007	N50-190

Parts:

Stock #	Description
WGR119-0083	Seal Kit
WGR710-0006	Rod End

Misc. Parts Available

Wagner Type N Hydraulic Steering Systems are exceptionally tough and reliable. They provide long and virtually maintenance-free performance.
Type N Hydraulic Steering Systems are available in 12 progressive sizes.

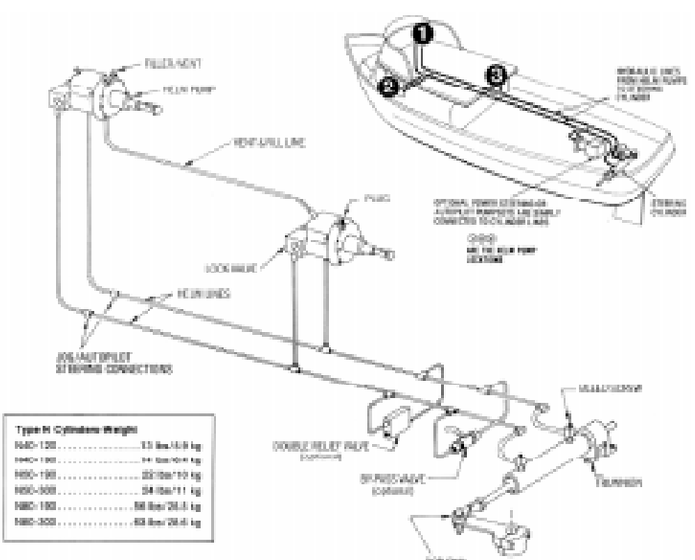
WHY WAGNER STEERING SYSTEMS?

- **Strong and compact design.**
  Larger bore and shorter stroke make cylinders more compact.
- **Corrosion free construction.**
  Cylinders are made of bronze, brass and stainless steel. Cylinder barrels are honed to provide a smooth surface.
- **Simple installation.**
  Self-aligning rod ends and trunnion mounting pads allow for easy installation, less critical alignment. Wagner systems have no pressure tank.
- **Tiller bolt and flex hoses included.**
  Tiller bolts are machined to provide accurate fit and high strength.
  Flex hoses are supplied with large-diameter ports minimizing hydraulic restrictions.
- **U-Cups used as dynamic seals.**
  Dynamic seals are dual U-cup seals which last much longer and provide better sealing than O-rings.

DEPENDABILITY AND PERFORMANCE

Over five decades of quality performance has made Wagner Hydraulic Steering equipment the standard for dependability and performance.
Today Wagner products are made and distributed by Summer Equipment Ltd. of Vancouver, Canada, a company with over seven decades of experience in the marine field and a reputation for design, engineering and manufacturing excellence.

The Wagner Type N Steering System offers smooth effortless control for all types of vessels.



Type N Cylinders Weight

N40-120	11 lbs/4.9 kg
N40-190	14 lbs/6.4 kg
N50-190	20 lbs/9.0 kg
N50-300	24 lbs/11 kg
N80-190	58 lbs/26.4 kg
N80-300	63 lbs/28.6 kg

*MODEL APPLICATION GUIDE

SYSTEM MODEL	DISPLACEMENT HULLS								PLANING HULLS	
	FLYBRIDGE		WORK AND PLEASURE BOATS		SAILBOATS					
					UNBALANCED RUDDER		UNBALANCED RUDDER			
	LENGTH	HP	LENGTH	HP	LENGTH	AREA	LENGTH	AREA	LENGTH	HP
N8145	16-30	325	30-40	140	29-40	3-10	26-36	3-7	28-46	400
N8100	28-30	330	30-40	160	38-46	5-13	30-40	4.8-8	33-50	450
N82135	23-30	340	40-46	168	48-56	9-15	36-50	6.5-9.5	40-52	500
N8160	26-40	360	40-60	170	56-66	10-17	40-60	8.5-12	43-58	600
N82200	28-40	380	40-60	188	58-66	15-18	43-52	9.5-15	46-60	650
N83230	28-40	390	40-60	190	58-66	20-25	46-60	12-16	48-62	700
N82300	30-40	250	50-70	208	52-66	17-25	50-62	12-16	56-68	750
N83400	33-46	380	60-80	258	62-72	19-30	56-66	13-19	60-78	850
N82500	38-52	350	60-80	308	66-74	20-32	52-72	14-21	60-78	900
N83-630	40-60	400	60-80	308						
N82800	50-65	500	60-98	408					72-88	1000
N821250	65-85	800	80-121	658					86-106	1300

a Overall length in feet.
b Device not certified.

*This is a reference guide only and counter selection may be detailed by a naval architect. Minimum submersible engine/transmission offset, mobile dimensions and draft required.

Seattle: (206) 285-5010 Fax: (206) 285-7925
Website: http://www.seamar.com
Call Toll Free: (800) 426-2783 8-5 M-F 9-1 Sat.
email: seamar@seamar.com

Wagner 700 Series
Cylinders

Stock #	Description
WGR700-0026	1-1/4 - 7
WGR700-0030	1-1/4 - 9
WGR700-0034	1-1/2 - 7

Parts:

Stock #	Description
WGR119-0097	Seal Kit
WGR21-60002	Rod End

Misc. Parts Available

700 SERIES SYSTEMS

Wagner 700 Series Hydraulic steering systems offer smooth reliable control of power or sail boats from 18 to 40 ft. in length. Ideal for replacement of obsolete or complicated mechanical systems.

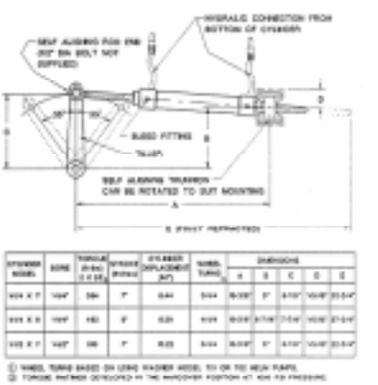
WHY A WAGNER CYLINDER?

- **Strong and compact design.**
700 series systems offer pleasure boaters and yachtsmen the same high quality design and construction found in larger commercial Wagner systems. Cylinders are a double acting, balanced displacement design.

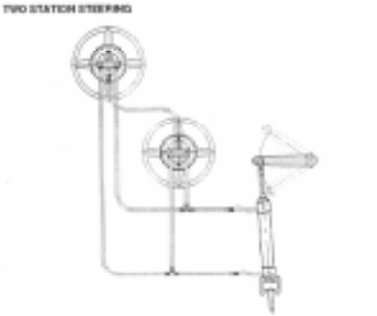
- **Flexibility.**
Standard systems use a 1¼ or 1½ cylinder with a 7" stroke. For outboard and inboard/outboard applications there is a 1¼ cylinder with a 9" stroke.

- **Corrosion free construction.**
Cylinder barrels are manufactured using anodized marine grade aluminum and honed to provide a smooth surface for longer seal life. The piston rods are constructed using stainless steel.

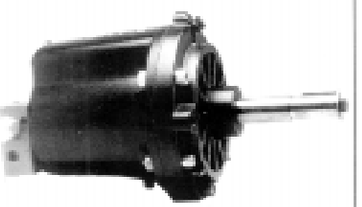
- **Simple installation.**
Self-aligning rod end and trunnion mounting pad allow for easy installation and less critical alignment. Bleed fittings installed in the cylinders ensure easy filling of the system.



TWO STATION STEERING



B 1-2 Helm Pumps



B 3-4 Helm Pump

701 Helm Pump

HELM PUMPS

Wagner Helm Pumps are high efficiency axial piston pumps with fixed, positive displacements from 1.35 cu.in/rev. to 0.99 cu.in/rev. They are matched to cylinder size to give the optimum number of wheel turns according to rudder torque.

WHY WAGNER HELM PUMPS?

- **Dependable**
  The pumps are a rugged all metal construction with a hard baked-on enamel finish. The drive shaft is supported by large bearings for greater strength and longer life. A replaceable external shaft seal is used.
- **Performance**
  The pistons are ground and honed, then fund assembled for precise fit, resulting in smooth operation and producing the most efficient manual hydraulic helm pump available.
- **Corrosion resistant finish**
  Housings are a marine grade aluminum with a hard baked-on enamel finish.
- **Multiple steering stations**
  Each pump operates independently and has full rudder control. A bellcrank on each pump prevents the wheel nut in use from "freewheeling" and eliminates the wheel effort required to maintain rudder position. For sailboats an optional helm control valve is available allowing the helmsmen to have rudder feel.
- **Simple installation**
  Wagner helm pumps have a simple tee bolt mounting and are designed to be located behind the dash panel. Some models are available with an optional front mount.
- **Non-pressurized system**
  The system is filled simply by pouring the recommended oil into the reservoir. No pressurization is required.

DEPENDABILITY AND PERFORMANCE

Over five decades of quality performance has made Wagner hydraulic Steering equipment the standard for dependability and performance.
Wagner products are designed and manufactured by Sleipner Equipment Ltd. of Vancouver, Canada, a company with over seven decades of experience in the marine field.

Wagner Hydraulic Steering Systems offer effortless control for all types of vessels.

Wagner Helm Pumps
B-Series

Stock #	Description
WGR300-0008	B1
WGR300-0009	B2
WGR300-0010	B3
WGR300-0011	B4

Parts:

Stock #	Description
WGR119-0085	Seal Kit B-1 thru 4
WGR400-0002	Lockvalve

Misc. Parts Available

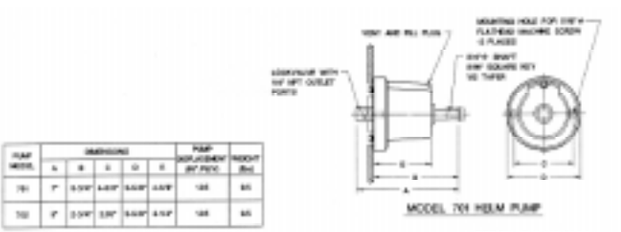
Wagner Helm Pumps
700 Series

Stock #	Description
WGR300-0007	701
WGR300-0041	702

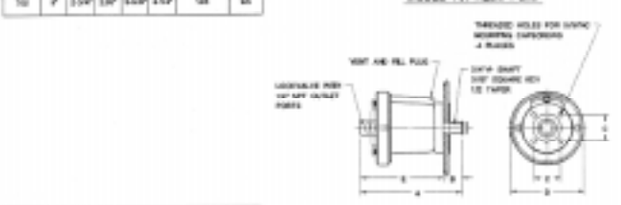
Parts:

Stock #	Description
WGR119-0002	Seal Kit
WGR130-0024	Trim Ring 702
WGR400-0001	Lockvalve
WGR119-0003	AW Seal Kit

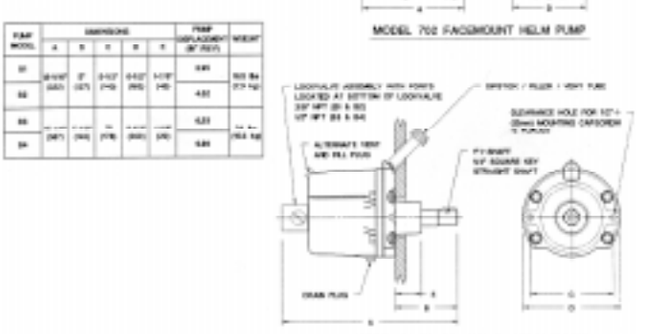
Misc. Parts Available



MODEL 701 HELM PUMP



MODEL 702 FACEMOUNT HELM PUMP

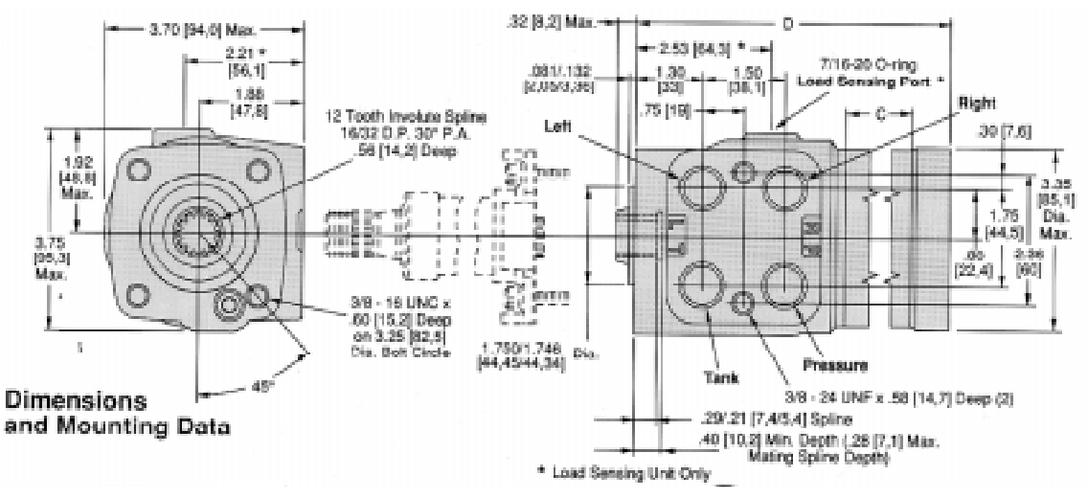


MODEL 01, 02, 03, AND 04 HELM PUMPS

Steering Control Units and Torque Generators

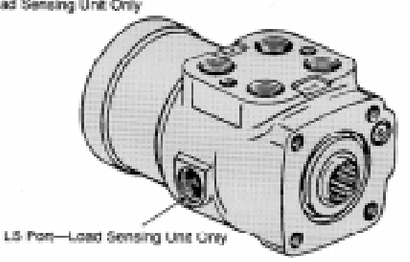
Char-Lynn® Power Steering

3, 6, and 12 Series Steering Control Units



Dimensions and Mounting Data

Displacement cu. in./rev. [cu. cm/rev.]	Dimension C in. [mm]	Dimension D in. [mm]
4.5 [75]	.40 [10,2]	4.96 [126,0]
5.9 [95]	.52 [13,2]	5.08 [129,1]
7.3 [120]	.65 [16,5]	5.21 [132,3]
8.9 [145]	.79 [20,0]	5.35 [135,9]
9.7 [160]	.86 [21,8]	5.43 [137,9]
11.3 [185]	1.00 [25,4]	5.56 [141,4]
14.1 [230]	1.25 [31,8]	5.81 [147,7]
17.9 [295]	1.59 [40,4]	6.14 [156,0]
22.6 [370]	2.00 [50,8]	6.56 [166,8]
28.2 [460]	2.50 [63,5]	7.06 [179,5]
35.9 [590]	3.19 [80,8]	7.74 [196,6]
45.1 [740]	4.00 [101,6]	8.56 [217,6]



LS Port—Load Sensing Unit Only

Specifications

Max. System Pressure . . . . . 2500 PSI [172 Bar]
Max. Back Pressure . . . . . 300 PSI [21 Bar]
Rated Flow
3 Series . . . . . 2 - 4 GPM [7,5 - 15 LPM]
6 Series . . . . . 4 - 8 GPM [15 - 30 LPM]
12 Series . . . . . 8 - 16 GPM [30 -60 LPM]
Max. System Operating Temperature . . . . . 200° F [93°C]
Max. Differential Between Steering Unit and System Temperature . . . . . 50° F 28° C
Input Torque
Powered . . . . 25 - 35 lb-in @ 100 PSI back pressure† [2,8 - 4,0 Nm @ 6,9 Bar back pressure] †
Non Powered . . . . . 100 lb-ft [136 Nm] maximum
Rotation Limits . . . . . None
Fluid . . . . . ATF Type A and most petroleum based fluids
Recommended Filtration . . . ISO 18/13 cleanliness level

† Low Torque Option Available

Char-Lynn® Power Steering

3 and 6 Series Steering Control Units

Columns **Shaft**
SPE2041001 ..... 7/8” Tapered
SPE20410015 ..... 3/4” Tapered

Ordering Information / Features

3 Series Order Numbers

System	Signal	Load Circuit	Rated * Flow GPM [LPM]	Port Size	Actual Displacement cu. in./rev. [cu. cm./rev.] — Product Number							
					4.5 [75]	5.9 [95]	7.3 [120]	8.9 [145]	9.7 [160]			
Open Center	N/A	Non Load Reaction	2-4 [7.5-15]	9/16-18	211-1001	211-1002	211-1003	211-1157	—			
Closed Center	N/A	Non Load Reaction	4 [15]	9/16-18	212-1009	212-1010	212-1011	212-1072	212-1012			
		Load Reaction	4 [15]	9/16-18	212-1021	212-1022	212-1023	212-1073	212-1024			

6 Series Order Numbers

System	Signal	Load Circuit	Rated * Flow GPM [LPM]	Port Size	Actual Displacement cu. in./rev. [cu. cm./rev.] — Product Number							
					4.5 [75]	5.9 [95]	7.3 [120]	8.9 [145]	9.7 [160]	11.3 [185]	14.1 [230]	17.9 [295]
Open Center	N/A	Non Load Reaction	4-8 [15-30]	3/4-16	211-1007	211-1008	211-1009	211-1137	211-1010	211-1011	211-1012	211-1158
		Load Reaction	4-8 [15-30]	3/4-16	211-1047	211-1048	211-1049	211-1159	211-1050	211-1051	211-1052	—
Closed Center	N/A	Non Load Reaction	8 [30]	3/4-16	212-1001	212-1002	212-1003	212-1069	212-1004	212-1005	212-1006	212-1070
Load Sensing	Static	Non Load Reaction	8 [30]	3/4-16	213-1001	213-1002	213-1003	213-1084	213-1004	213-1005	213-1006	213-1085
Load †† Sensing	Dynamic	Non Load Reaction	8 [30]	3/4-16	213-4001	213-4002	213-4045	213-4042	213-4046	213-4043	213-4047	213-4044

Tiller Arms
(Bronze)

Stock #	Length	Bore	Key
MHI8TA	8”	1-1/4”	5/16”
MHITAHR1500-8	8”	1-1/2”	3/8”

Instatrim Boat Levelers

A Proven System for Maximum Performance

Instatrim, the original hydraulic boat leveler, provides a better ride every time you leave the dock. A simple rocker type control permits you to correct a bow high or list condition on any shape hull, from 16 to 60 feet. Easy to install Instatrim boat levelers are strong and durable, and come in lengths to fit most boats. Custom sizes are available too, so any boating enthusiast can enjoy a superior ride. Instatrim's over 25 year commitment to the boating industry assures you of a quality product and an excellent performance.

Benefits:

• Easily Installed
Comes pre-assembled with mounting hardware. They are easily and quickly installed, and a minimum of time is required.

• Level Ride
Instatrim Boat Levellers put your boat in proper trim and correct listing, making for a smooth, enjoyable ride for you and your passengers.

• Increased Visibility
A level ride improves the skipper's visibility. You and your passengers are more secure and boating safety is improved immeasurably.

• Environmentally Responsible
Your smooth, level ride allows the engine to run more efficiently, increasing your mileage, saving fuel and stretching your boating dollars.

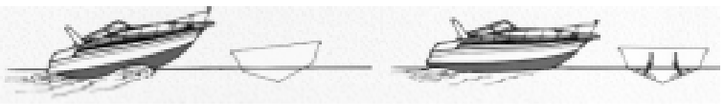
• Longer Boat Life
In proper trim you stay on plane at lower R.P.M.'s. Your engine doesn't labor and engine life is extended substantially. Less wear and tear on your craft ensures more years of boating pleasure.

• Improved Performance
Instatrim boat levelers allow you to throttle back regardless of load and speed.

• Wiring
Color-coded wiring in 25' to 40' lengths with quick connect fittings, meets federal standards for heat, pull and insulation, making installation easy.

• Solenoids
They are custom designed for Instatrim boat leveler company, epoxy sealed and humidity resistant, thereby preventing shorting out. The solenoids lock the tabs in any position, eliminating driftback. Barb type hose fittings provide tight, secure connections.

Simple Push
Button Controls



Bow High or Listing
Tabs Off

Corrected Bow and List
Tabs On

• Motor
A powerhouse with coated wirings and a thermal ovreload that resists temperature and amperage build-up. 1-3/4" stack windings and top mounting eliminates oil leakage. The motor is mounted with stainless steel nuts and bolts, and is easily disassembled.

• Pump
Designed and engineered exclusively by Instatrim. The built-in bypass is factory set at 400 P.S.I. tolerance held to ±.00025. Amperage doesn't have to exceed 16 because the unit circulates oil, rather than stalling out or trying to pump additional pressure.

• Brackets
Swivel type brackets allow cylinders to be mounted and adjusted to ant angle. Knockout pins act as shear pins if tab strikes an object.

• Cylinders
Impact resistant, fiberglass reinforced nylon cylinder eliminates expansion and resists ultra-violet rays. Two expanding type seals, plus O-ring eliminates high and low pressure leaks. Barbed cylinder fitting and an inserted tubular rod prevents hose blow-off and breakage. A stainless steel spring retracts the cylinder when the boat is not in motion.

• Trim Tabs
12 gauge 304 stainless steel trim tabs are available in standard and custom lengths. They are guaranteed against electrolysis, remaining strong and secure. Instatrim's hinges prevent most spray and can be used for transom or bottom mounting.

• Motor Cover
4-1/2" D x 6" W x 11" H, high impact ABS plastic cover with a built-in oil reservoir mounts easily with two screws. The filler is located in front. A cover protects the motor from occasional washdown.

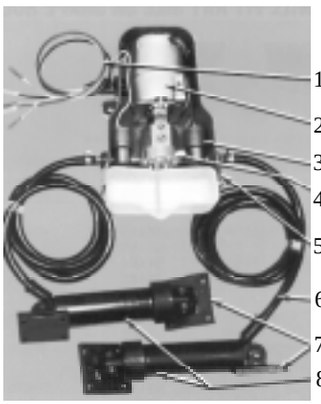
• Hose
Designed and manufactured exclusively for Instatrim with nylon reinforcement webbing and a protective PVC coating. Rated at 2000 lbs. burst pressure, 15' of hose is supplied for your system. Entering the transom 6" above the waterline, the hoses are held securely with hose trim. Stainless steel clamps hold the hose to barb fittings at the solenoid.

• Rocker Type Controls
Mounted on the dash they are easy to operate. 2TP Micro swiitch with silver contact points adjust the tabs for maximum control and performance.

One pint of transmission fluid, funnel and mounting hardware is supplied.

Stock #	Boat Type	Boat Length	Tab Size
BLCN120000	Single O/IO		12" x 8"
BLCN180000	Single O/IO		18" x 8"
BLCN121100	Twin O/IO		12" x 11"
BLCN141100	Twin O/IO		14" x 11"
BLCN181100	Twin O/IO		18" x 11"
BLCN241100	Twin O/IO		24" x 11"
BLCN241821	Inboard	18' - 21'	24" x 8"
BLCN302225	Inboard	22' - 25'	30" x 8"
BLCN362629	Inboard	26' - 29'	36" x 8"
BLCN403036	Inboard	30' - 36'	40" x 8"
BLCN463741	Inboard*	37' - 41'	46" x 8"
BLCN504250	Inboard*	42' - 50'	50" x 8"
BLCN555155	Inboard*	51' - 55'	55" x 8"
BLCN605663	Inboard*	56' - 63'	60" x 8"
BLCN726100	Inboard*	61' - Up	72" x 8"

* Two hydraulic cylinders per tab.



1. Wiring
2. Motor
3. Solenoids
4. Pump
5. Motor Cover
6. Hose
7. Brackets
8. Cylinders

Adjustable Trim Tabs

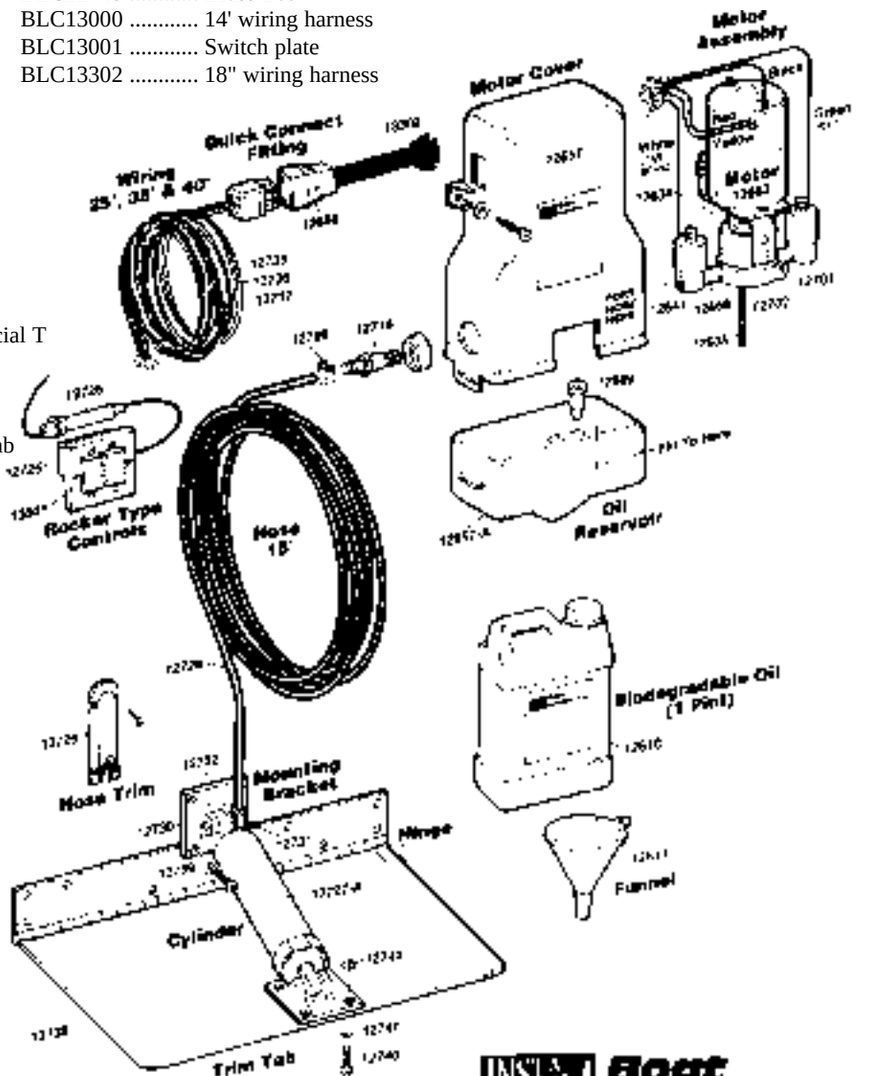
Made of sturdy, lightweight, Marine grade aluminum, Tempo Trim Tabs provide quick planing, low-RPM cruising and increased fuel efficiency. They are fully adjustable, easy to install and available in a variety of sizes to fit various boat lengths.

Stock #	Tab Width	Tab Length	Boat Length	Wt./ pair
TEM901TC4	6"	3-1/4"	to 14 ft.	2 lbs.
TEM902TC5	8"	4-1/4"	to 16 ft.	4 lbs.
TEM903TC12	12"	4-1/4"	to 18 ft.	9 lbs.
TEM904TC14	14"	4-1/4"	to 21 ft.	12 lbs.

BLC01 ..... Plastic Hose Collar
BLC02 ..... Funnel
BLC03 ..... U-Cup
BLC04 ..... O-Ring
BLC05 ..... Oil - 1 pint
BLC06 ..... Fastener set
BLC08 ..... Cylinder spring
BLC12609 ..... Oil Reservoir Plug
BLC12634 ..... Motor to shaft conv.
BLC12641 ..... White 12V solenoid
BLC12657 ..... Outside housing
BLC12657-A ..... White reservoir only
BLC12662 ..... 12V motor
BLC12688 ..... Female wiring recepticle
BLC12700A12V .. 12V Motor/pump unit special T
BLC1270012V ..... 12V motor/pump unit
BLC12701 ..... Green solenoid (12V)
BLC12701A ..... Green solenoid (32V)
BLC12702 ..... Hydraulic pump for trim tab
BLC12709 ..... SS hose clamp
BLC12715 ..... Solenoid Hose Fitting
BLC12725 ..... Complete switch
BLC12725A ..... One switch only
BLC12726 ..... Circuit breaker
BLC12727 ..... Hydraulic Cylinder
BLC12727A ..... Cylinder with hose
BLC12728 ..... Hydraulic hose
BLC12729 ..... Hose trim with screws
BLC12730 ..... Cylinder pin
BLC12732A ..... Bracket for tab
BLC12735 ..... 15 foot wiring harness

Tab only:
BLC12738A12X8 Race boat 12"X 8"
BLC1273812X11 . 12 X 11
BLC1273812X8 ... 12 X 8
BLC1273814X11 . 14 X 11
BLC1273818X11 . 18 X 11
BLC1273818X8 ... 18 X 8
BLC1273824X11 . 24 X 11
BLC1273824X8 ... 24 X 8
BLC1273830X8 ... 30 X 8
BLC1273836X8 ... 36 X 8
BLC1273840X8 ... 40 X 8

BLC12740 ..... Bolt 1/4 x 5/8
BLC12741 ..... 1/4" SS lockwasher
BLC12742 ..... 1/4-20 SS hex nut
BLC12743 ..... Brass Tee
BLC13000 ..... 14' wiring harness
BLC13001 ..... Switch plate
BLC13302 ..... 18" wiring harness



MADE IN THE USA

INSTA TRIM Boat Leveler Co.

Seattle: (206) 285-5010 Fax: (206) 285-7925
Website: http://www.seamar.com

Call Toll Free: (800) 426-2783 8-5 M-F 9-1 Sat.
email: seamar@seamar.com